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MITSUBISHI ELECTRIC

I.T. Cooling Tower

Close Control Computer Room Air Conditioning Systems

The need for high sensible cooling and close control of both temperature and humidity in critical IT environments has never been greater. Mitsubishi Electric is to the forefront in developing solutions for this specialist sector and has just unveiled its new DX range which provides close control of temperature and humidity, especially in small to medium sized enterprise data centres. Apart from addressing the critical issues of density and capacity, other benefits include low-noise impact and significant energy savings.

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EDITORIAL

We must embrace digitalisation

Digitalisation is now the top priority if construction, and especially building services engineering, is to deliver on our energy saving, carbon reduction, wellbeing and sustainability targets. To that end we begin a six-part series on digitalisation in this issue, while other articles from leading industry commentators also refer to digitalisation.

Further evidence of its growing importance is demonstrated by the sums allocated for digital priorities by the EU's four largest countries in their submissions for funding under the Next Generation EU (NGEU) €795 billion recovery plan – Italy: €42 billion; Spain: €16 billion; Germany: €15 billion; France: €10 billion.

Ireland should take the lead from Germany on this. While it receives the lowest amount in Euros, its proposed spend represents more than 50% of the total it will receive from the fund.

What better example to follow.

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Digitalisation is a game-changing strategy that will empower the construction sector to thrive and deliver the expertise for sustainable energy skills. In the first of a six-part series Paul McCormack explains the direct correlation between digitalisation and energy efficiency.

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NEWS AND PRODUCTS

Mitsibishi Electric air purifier

Mitsubishi Electric has developed a bolt-on air purifying device for existing air conditioning units that is said to be capable of neutralising indoor pollutants, including inhibiting SARS-CoV-2.

The Plasma Quad technology is said to significantly improve indoor air quality by neutralising viruses, bacteria, allergens, microscopic particles (PM 2.5), dust and mould.

Also, based on tests conducted at the Microbial Testing Laboratory, Japan Textile Quality and Technology Centre in Kobe, the technology is capable of inhibiting 99.8% of SARS-CoV-2.

Contact: Fergus Daly, Area Sales Manager, Mitsubishi Electric. T: 01 – 419 8800; M: 087 – 182 6536; email: fergus.daly@meir.mee.com

ECI Energy and Acutrace partnership

ECI Energy has taken an equity investment in Acutrace in a development that also saw Enterprise Ireland provide matching investment funds. This partnership creates a unique solution combining the Acutrace energy measurement and sustainability software with products and solutions from ECI Energy including LED lighting, photovoltaics and EV charging.

Acutrace and ECI Energy have identified several new business areas that will be developed using this perfect combination of software and energy efficient hardware in 2021.

Left: Mark Connolly, CEO, ECI Energy and Aidan McDonnell, CEO, Acutrace.

LEDVANCE appoints new Head of Trade Sales

LEDVANCE has appointed Nelo Neves as Head of Trade Sales in the UK and Ireland on the retirement of Steve Stark following an impressive 36 years at OSRAM and LEDVANCE (since 2016).

Commenting on his appointment, Nelo Neves said: "Steve leaves us a brilliant legacy at LEDVANCE, building an exceptional team in the UK and Ireland. His service to LEDVANCE and the lighting industry has been outstanding. I look forward to building on our strong relationships with our partners and customers in the UK and Ireland, and to addressing the new challenges and opportunities that the lighting market presents."

Nelo Neves previous role was Managing Director for LEDVANCE South Africa (since 2018). Across his career he has worked in Spain, Holland, Sweden and the African continent.

Condair retirement

Tim Scott, Sales & Marketing Director at humidity control specialist Condair, has retired after 32 years service with the company. Having originally joined in 1988 when it was known as JS Humidifiers, Tim became Service Director 13 years later and then Sales & Marketing Director in 2007. During his time Tim has seen the company successfully expand its operations to become an international market player serving the UK and Ireland, in addition to South America and Asia. It became an integral part of the global Condair Group in 2014.

Building Services Engineering joins with Tim's colleagues, and his many friends and clients throughout the industry, in wishing him a long, healthy and happy retirement.

Lean Construction Conference

Lean Construction Ireland will hold its annual conference on a virtual platform on Wednesday, 3 November 2021.

The theme of the event will be "Delivering Projects Better, Faster, Together" and the aim is to inspire and challenge the industry to implement lean practices. See https://leanconstructionireland.ie/

NEWS AND PRODUCTS

NSAI Standard on heat pumps

The National Standards Authority of Ireland (NSAI). working in tandem with SEAI and industry representatives, has developed and published a new national standard recommendation for the design and installation of heat pumps in homes.

This new standard recommendation is one of a suite of measures that were developed by NSAI in direct response to actions set out in the Climate Action Plan 2019.

The standard recommendation (SR 50-4:2021) concentrates on domestic heat pumps that provide heating and hot water. It contains guidelines for the design, installation, commissioning and maintenance of such heat pump systems.

Contact: John Parsons, National Standards Authority of Ireland.
T: 085 -758 8289;
E: john.parsons@nsai.ie

Johnson Controls to acquire Silent-Aire

Johnson Controls has entered into a definitive agreement to acquire Silent-Aire, a leader in hyper-scale data centre cooling and modular critical infrastructure solutions.

This all-cash transaction is valued at up to $870m, including an upfront payment of approximately $630m and additional payments to be made subject to the achievement of post-closing earn-out milestones.

Silent-Aire specialises in the design, engineering and manufacturing of mission-critical custom air handlers and modular data centres for hyper-scale cloud and colocation providers. Its portfolio of solutions allows for rapid deployment of critical infra-structure in flexible configurations.

The deal is expected to be concluded in the Autumn of this year.

Wilo leads on climate neutrality

The Wilo Group is currently celebrating three sustainable milestones – the successful completion of the TüV certification as a "climate-neutral company in Dortmund"; the Leadership in Energy and Environmental Design (LEED) Gold Certification award from the US Green Building Council (USGBC); and the Gold Certification of the German Sustainable Building Council (DGNB). Both the latter are for the Wilo "Pioneer Cube" administration office building.

"For the Wilo Group, climate protection is not just part of the business model but has always been an integral part of our DNA", says said Oliver Hermes, President and CEO of the Wilo Group. "We feel strongly that companies have an obligation to take on corporate political responsibility and to actively commit themselves to more sustainability and climate protection."

Based on the company's own "Ambition 2025", Wilo has developed a holistic sustainability strategy that takes all stakeholders into account and is implemented across the whole Wilo-World. "We set ourselves the goal of climate-neutrally at all our main production sites by 2025 and to have already achieved this at the Dortmund location is fantastic," explains Derek Elton (above), Managing Director, Wilo Ireland. "To achieve LEED and DGNB Gold Certification for the 'Pioneer Cube' on top of that is truly amazing," he concluded.

Climate upskilling initiative

Climate Ready is a five-year national climate upskilling initiative developed in partnership with industry to equip businesses with the skills they need to respond to climate change. Skillnet Ireland, together with the private sector, will invest over €10 million in the Climate Ready initiative from 2021-2025.

Developed to support the Government's Climate Action Plan and the Climate Action and Low Carbon Development Bill, Climate Ready sees Skillnet Ireland partner with Chambers Ireland, Wind Energy Ireland and Sustainable Finance Ireland to support over 1,100 companies and 3,000 workers throughout Ireland in its first year.

Leveraging Skillnet Ireland's experience in delivering upskilling and management development to 18,000 businesses annually, Climate Ready will offer several pathways for businesses to build sustainable operating models and develop green talent.

See www.climateready.ie

Pictured bove is Minister for Further and Higher Education, Research, Innovation and Science, Simon Harris.

Schneider appointment

Schneider Electric has appointed Chris Collins as Country President for Ireland in place of Kelly Becker who was recently appointed Zone President for UK & Ireland.

With 17 years of experience at Schneider, Chris has overseen the smart buildings business, covering both the commercial and residential sectors in the US, and most recently held the role of Vice President Systems Transformation, Digital Energy.

Schneider Electric has deep roots in Ireland, stretching back to the creation of Schneider Electric Ireland Ltd in 1984 and its acquisition of APC, including the Galway manufacturing facility, in 1994. Schneider Electric Ireland currently employs around 400 people at its Dublin, Galway and Belfast facilities.

NEWS AND PRODUCTS

Sustainable Energy Community Network

Five hundred communities are now part of the SEAI's community energy network and have led the way by completing energy upgrades in homes, businesses and public and community buildings. Others are looking to larger-scale renewable sources of energy to benefit their area.

William Walsh (left), CEO of SEAI, said: "The network is growing rapidly, demonstrating the appetite that exists among citizens and communities to take charge of their collective energy futures. We are now one third of the way towards the Government's goal of 1,500 sustainable energy communities by 2030.

"Those who want to get involved can join a community close to them by searching our online network map. Alternatively, those who want to set their own path can establish a community energy network with committed participants in their own area."

Revised EPBD consultation

The EU Commission has invited public consultation on revising the Energy Performance of Building Directive (EPBD) in the context of the European Green Deal ambition to achieve climate neutrality by 2050.

The issues raised in the consultation relate primarily to ways in which building renovation can be boosted – not only in terms of the number of renovation projects, but also in trying to achieve deeper renovation.

Revising the EPBD is central to adapting the current regulatory framework, and will follow on from a wide range of proposals in the "Fit for 55" package, including proposed revisions to the Energy Efficiency Directive, due for presentation in June.

This consultation will be open for input from stakeholders and citizens until 22 June 2021.

Fire centre 'home and dry' with Condair

Firefighters at a new training centre are benefiting from a Condair dehumidifier to dry out their protective kit at the end of each wet training exercise. Strict control of moisture in a drying room is essential to save firefighters' gear from the effects of water damage after a call-out or a training exercise. It's vital that they have access to a drying facility to prevent extensive damage and potentially significant replacement costs for the fire service.

The Condair DC 50W wall-mounted unit was sized on the basis of the quantities of kit hung in the room to dry when the firefighters return from training exercises. It is part of a range of condensing dehumidifiers that offer powerful drying performance, are easy to install and have an attractive galvanised sheet metal cover with powder-enamel finish. The wall-mounted versions can be supplied with steel feet for extra stability.

As well as the built-in digital user interface, the dehumidifier has an optional remote wall controller, which can be located up to 50m away. Remote mechanical hygrostats are also available.

Capacities available in Condair's wider condensing dehumidifier range go from 49lt to 930lt per day with airflows of up to 8,000m³/h. They can provide dry air directly to a room or be connected to a building's ducted ventilation system. Models are also available with an external condenser that can expel the heat generated during the drying process remotely and therefore manage temperature control as well as humidity.

Contact: Damien Power, Condair Technical Area Sales Manager, Ireland. T: 091 – 507 120; E: ie.sales@condair.com; www.condair.ie

Centre of Excellence

Minister for Housing, Darragh O'Brien TD, has said he fully supports plans to establish the first UNECE European Centre of Excellence for High Performance Buildings in Enniscorthy where, to date, the current NZEB centre has already trained over 1,000 construction professionals.

The NZEB training centre is operated by Waterford and Wexford Education and Training Board (WWETB). Minister O'Brien welcomed the fact that the WWETB has partnered with Wexford County Council to form the High Performance Building Alliance which is seeking to establish the first UNECE European Centre of Excellence for High Performance Buildings in Enniscorthy.

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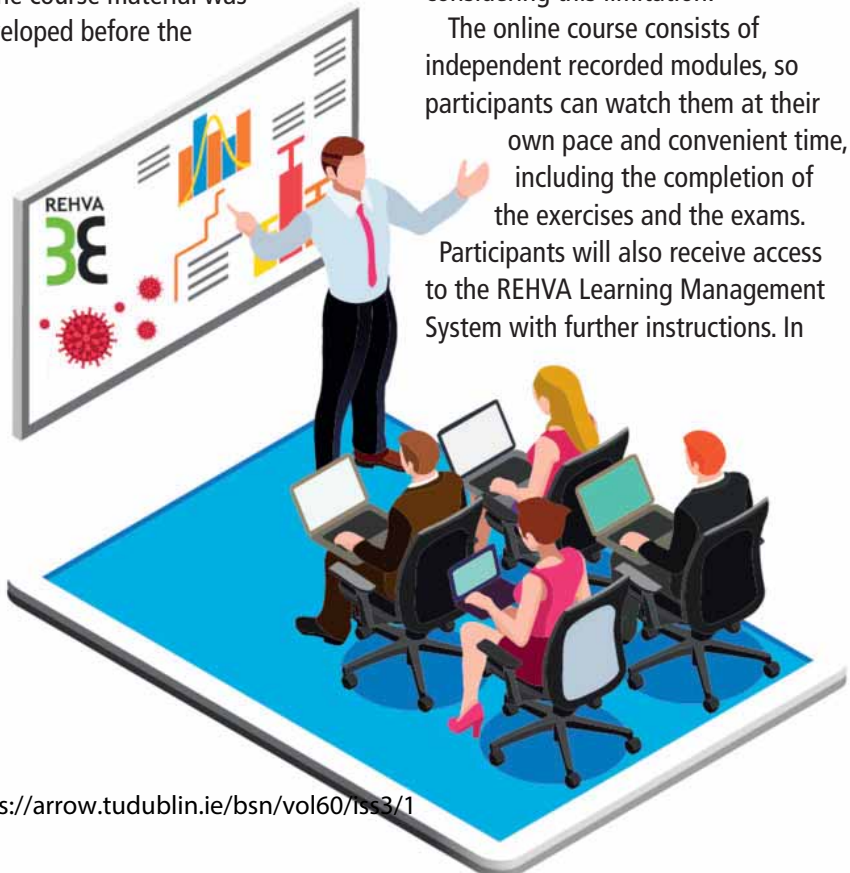
Safe operation of **HVAC SYSTEMS** during Covid

The Federation of European Heating, Ventilation and Air Conditioning Associations (REHVA) is now offering an online course covering key topics on how to resume activities, safely operate buildings and specifically use densely-occupied indoor spaces during and after the Covid-19 pandemic. It is based on the REHVA Covid-19 guidance documents and its modules provide basic theoretical knowledge, along with hands-on information, taught by REHVA experts.

Participants also get access to the latest REHVA guidebooks on air filtration and the hygiene requirements of ventilation systems. After going through the training material, the trainees – who also successfully complete the online exams – obtain a certificate verifying they have done so.

The course material was developed before the detection of the latest, more contagious, SARS-CoV-2 variants (in the UK, South-Africa etc), and any subsequent research on the topic has not been considered for its development and update. Therefore, any contained information, recommendations and guidelines should be interpreted considering this limitation.

The online course consists of independent recorded modules, so participants can watch them at their own pace and convenient time, including the completion of the exercises and the exams. Participants will also receive access to the REHVA Learning Management System with further instructions. In addition, REHVA experts will provide live online consultations at agreed time slots where participants can ask questions about the completed modules.



Who could benefit from course

- Facilities and building managers;
- Building services contractors;
- Mechanical and HVAC engineers;
- Ventilation and air conditioning specialists;
- Building professionals involved in the management of indoor environments.

Learning outcomes

After the course participants will:

- Understand the science behind SARS-COV-2 transmission, risk mitigation and the key role of air quality, air distribution solutions and adequate ventilation in infection control;
- Understand the key aspects and necessary measures to take on HVAC systems when resuming indoor activities and reopening public spaces;
- Know how to assess and compare different HVAC solutions regarding infection risk in buildings and separate rooms;
- Have an overall understanding of HVAC engineering measures and current technologies to prevent and/or limit airborne viral transmission, and to reduce the number of cross-infections indoors;
- Obtain practical guidance on the safe use of densely-occupied spaces in different building types.

Course cost

Basic fee (non-members): €300 (excl VAT).

Fee for members of REHVA Member Associations and supporters: €200 (excl VAT).

Pre-registered non-members will receive a 10% discount, while special rates apply for groups of more than five people.

Email: info@rehva.eu for details. ■

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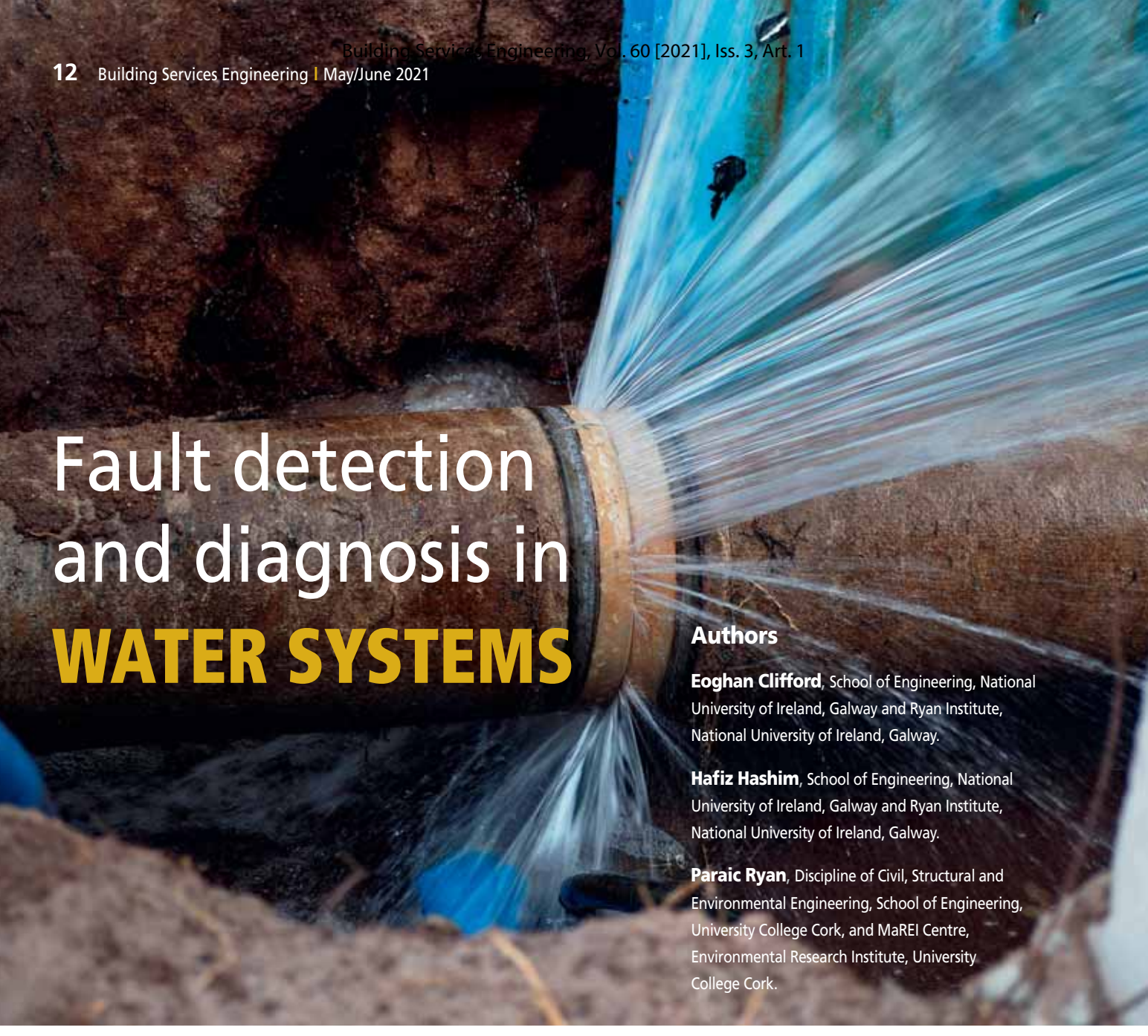

Fault detection and diagnosis in WATER SYSTEMS

Authors

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Large non-residential buildings can contain complex and often inefficient water distribution systems. The need to efficiently use water is being driven by overall sustainability goals, water scarcity (in some places) and the need to reduce costs. Thus, it is increasingly important to effectively detect and diagnose faults in water distribution systems in large buildings. In many cases if water supply is not impacted, water loss due to faults can go unnoticed for long periods. This can lead to unnecessary increases in water usage and associated energy consumption arising from water pumping, treating and heating.

The majority of fault detection and diagnosis (FDD) studies in the water sector are limited to municipal water supplies and leakage detection (Cody and Narasimhan, 2020; Seyoum *et al.*, 2017). The FDD in building water networks remains largely unexplored. This is also a relatively complex and challenging area, as the non-stationarity (i.e., variations in statistical properties over time) of water usage in non-residential buildings makes it challenging to distinguish between normal and anomalous water usage. The overall objective of FDD in non-residential water distribution systems is summarised in Figure 1 (next page).

While considerable attention has been given to data-driven methods that analyse and control energy systems in buildings, the same cannot be said for building water systems. As a result, approaches which support enhanced efficiency in building water consumption are somewhat underdeveloped, particularly in industrial settings. Given the links between water and energy systems, faults in a water distribution system can impact overall building energy use and associated carbon footprint.

Existing methods and their limitations

Conventional fault detection systems typically comprise alarms which are triggered when a relatively high level of water is consumed and provide high-level statistics on water consumption. Typically, in such systems when water consumption exceeds a predefined threshold, an alarm is triggered automatically. While the alarm may not be designed to detect excessive water

consumption due to improper use (e.g. a tap left running) or other anomalous water uses (such as hosting a one-off event or increased production for a short period of time), it can be adapted to do so.

However, such systems are unable to identify complex patterns of water usage, such as distinguishing between actual faults or anomalous/inefficient water uses. Furthermore, conventional systems are embedded with alarm notification features that require assistance from experts with day-to-day operational insights to choose thresholds for faults (Mulligan *et al.*, 2020; Perfido et al., 2016).

As mentioned already, the prediction of faults for non-residential water distribution systems is made more difficult by the non-stationarity of water usage (e.g. water consumption can vary between seasons and depend on working hours, holiday periods, etc.) (Prabuchandran *et al.*, 2019). This non-stationarity results in high incidence of false alarms when conventional fault detection approaches are used.

It is also important to note that data availability for non-residential building water distribution systems represents a significant and persistent challenge when compared to municipal water distribution systems. This has led to a relatively low industry uptake of fault detection and diagnosis systems, or where in place, alarms are often ignored (*Prabuchandran et al.*, 2019).

Our work to date

Our research teams at NUI Galway and UCC have developed a fault detection and diagnosis methodology called FastDetect which uses temporally sensitive, unsupervised and supervised learning models (namely principal component analysis and support vector machines), capable of identifying complex patterns within data. These approaches have the potential to address the shortcomings associated with conventional methods, addressing industry needs.

FastDetect is particularly useful in identifying anomalous water uses and faults of different types (such as equipment malfunctioning, high or low-level imperceptible process faults), in addition to water leakage. FastDetect was developed using data from case-study sites with various faults and outliers, whereas existing studies typically utilise generated or experimental data sets. FastDetect is also capable of considering biased uncertainties and non-stationarity of water use, addressing the key challenges discussed above.

Figure 1: Key objectives of fault detection and diagnosis systems for water networks.

For many non-residential buildings reliable and objective information about water use and network performance is poor, lacking or unavailable. FastDetect was developed and designed to deliver to that brief even with limited data availability; as metering improves the system adjusts to this new information.

The effectiveness of the FastDetect has been examined through two case-study sites. The first was an Irish food and drinks company with production and distribution facilities, offices, a canteen and toilet facilities spread across 9,300m^2 of floor space and

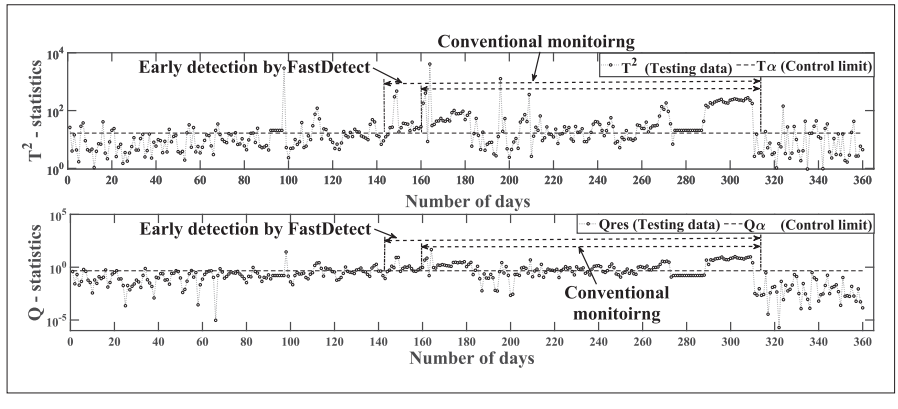

Figure 2: Fault detection using FastDetect.

separate, extensive yard space. The second site was the Alice Perry Engineering Building at NUI Galway. The 14,000m^2 building houses approximately 1,100 students and 100 staff during teaching and exam terms (approximately 26-28 weeks a year) and about 150 research, academic, administrative and technical staff and 50-100 postgraduates during the rest of the year.

Figure 2 compares the effectiveness of FastDetect with an in-situ conventional fault detection system using data obtained from the food and drinks production facility. The fault was a low-level imperceptible process fault which went unsolved at the case study site for a period of five months. As can be seen from the Figure 2, FastDetect detected the fault almost immediately (over two weeks earlier than the third-party data monitoring system at the site) and triggered an alarm as can be observed in Figure 2. Furthermore, while the in-situ system detected the anomaly two weeks later, the alarms were ignored due to the almost daily presence of "alarm notifications". The daily alarm notification, prior to this fault, were generally the result of required, but not regular, water use which the existing system notified as daily alarms.

To contextualise the water loss, it was observed that during the fault period the facility water consumption increased by of 3.4 m^3/day (an increase of 68% on normal water consumption). In this study of the 181 alarms which were detected by FastDetect, 13 were false alarms. The team then developed and implemented a false alarm moderation module which is integrated with FastDetect and was found to provide further mitigation against the possibility of false alarms, reducing these from 13 out of 181 to 7 out of 181 alarms. It should be noted, as can be seen in Figure 2, that a high number of alarms detected were due to one single issue (excluding the false alarms).

In the case study of the Alice Perry Engineering Building over a six-month validation period FastDetect showed greater than 90% accuracy in correctly classifying system alarms. The vast majority of the system alarms were correctly classified as non-routine usage (e.g. due to conferences or non-routine laboratory work) and thus not identified as faults. Of the 16 sets of faults identified, 15 were correctly classified as a metering error and the 16th was classified as an excess usage fault. This level of detail is essential in enabling building managers distinguish between faults and excess usage which may be due to one-off events and thus not a fault.

The system can be implemented using a series of standard steps as outlined in Figure 3 and the system can also provide key statistics on water usage for sustainability monitoring and reporting within organisations.

Findings and future direction

Despite the relatively limited training data available from the case-study sites (which would reflect the situation in

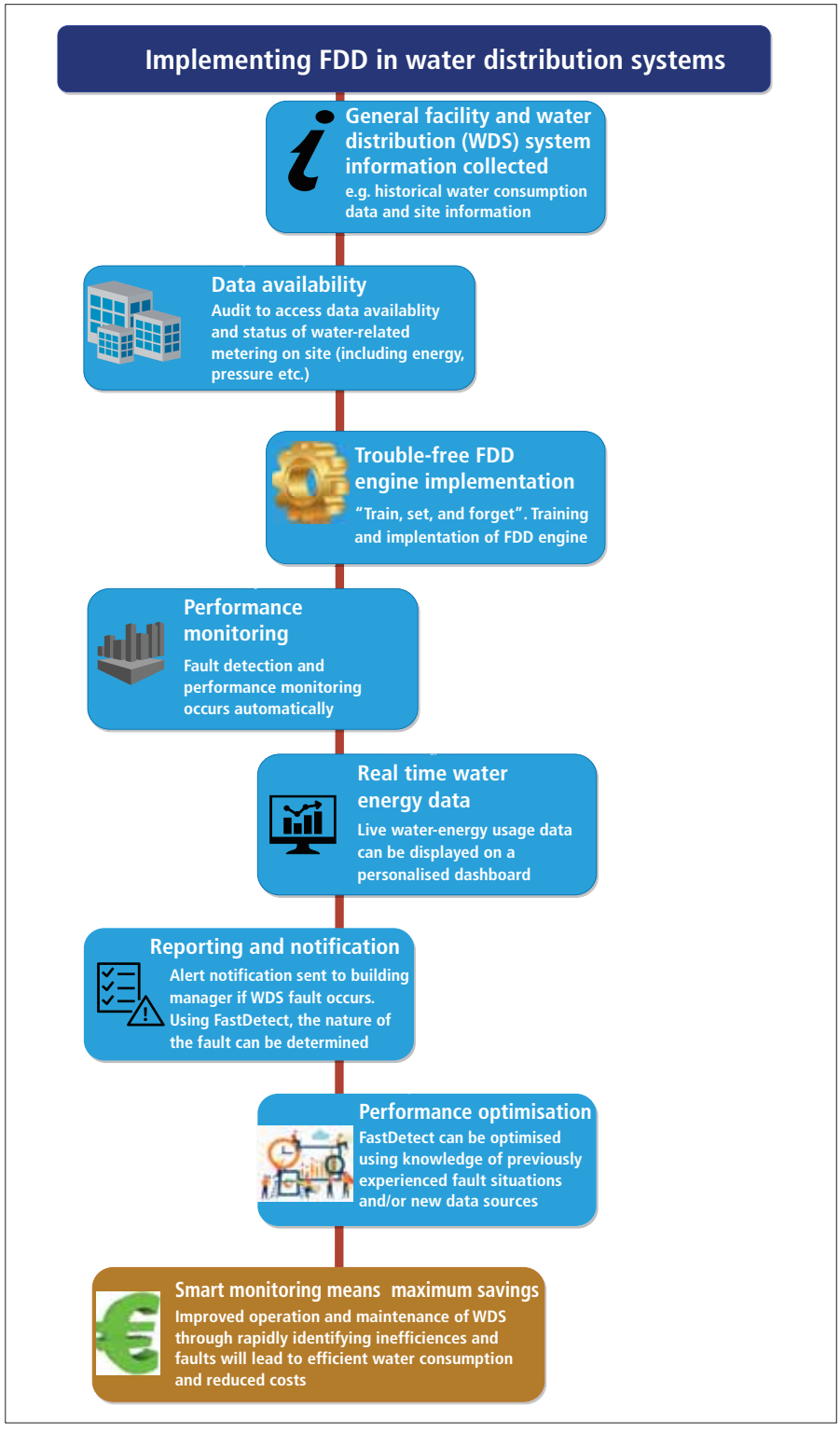

Figure 3: Outline of FastDetect in non-residential water distribution systems.

many non-residential buildings), FastDetect proved successful in discriminating between various types of faults in the case-study buildings and demonstrated promising capabilities when compared to the conventional fault detection systems. The multi-class support vector machine also allowed these faults to be classified, providing a greater level of information to building managers, which may avoid unnecessary emergency shutdown in industrial applications.

FastDetect does not require large amounts of fault training data (an issue with machine learning approaches for industrial buildings). It requires less computational resources when compared to physical models of water distribution systems and can easily be run using a standard PC.

Another important characteristic is adaptability. Once a new fault or anomalous situation is identified, the FastDetect model can be updated to incorporate this additional information. This adaptation will make the system more reliable and valuable in time and make it reactive to planned changes in water usage on site.

FastDetect can be embedded/integrated into existing building management systems or can be tailored to each non-residential facility and to the specific user (building managers, practitioners, etc). The next steps are to launch full-scale real-time trials of the systems and the research team is discussing options with potential industrial partners.

Acknowledgements

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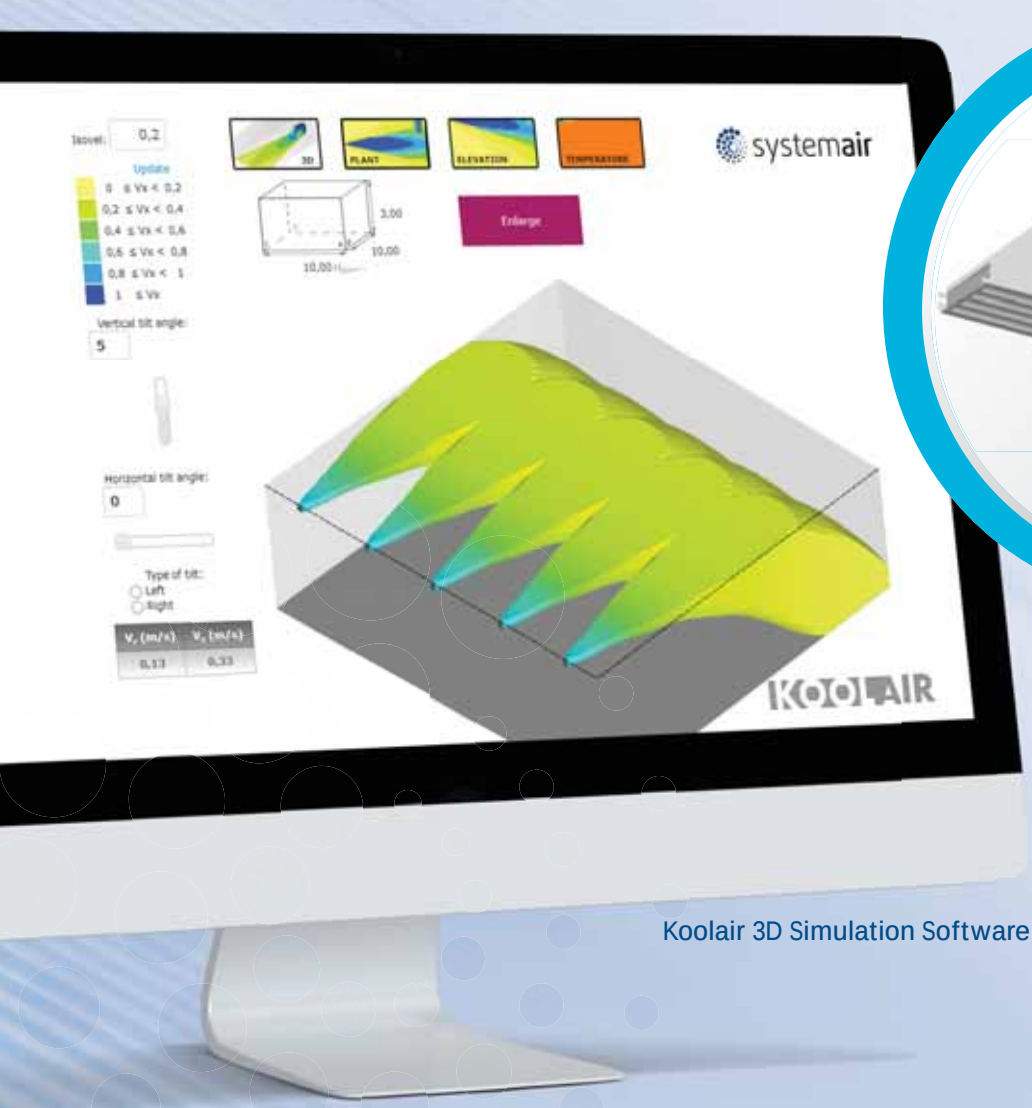
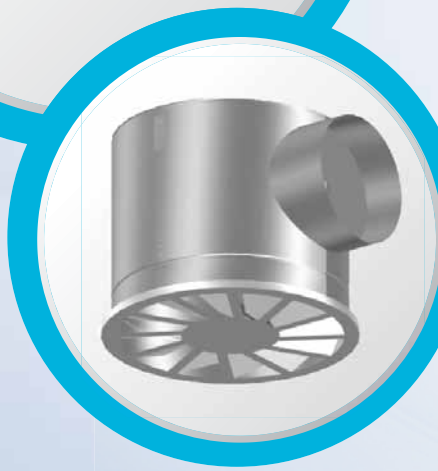


Koolair 3D Simulation Software



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ENERGY MODELS OVER-SIMPLIFIED

Compliance modelling methodologies not fit for the significant climate challenges that lie ahead

Globally, commitments are being made by organisations to decarbonise their building assets by 2050. In parallel with this, legislators and green building councils are drawing up plans to set out roadmaps to achieve all this, which is set to become one of the greatest challenges the built environment has ever had to deal with. We know that buildings are responsible for 30% to 40% of energy consumption and CO2 emissions, and so all of us working in this industry have an obligation to dramatically reduce the impact that the built environment has on climate change. In this article John Treanor (above), Sustainability Engineer & Energy Analyst with Passive Dynamics Sustainability Consultants, says that our legislators need to take urgent action to address these issues, and to improve how the performance of buildings are assessed.

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Hidros high-efficiency heat pumps are specifically designed for applications requiring maximum efficiency when heating. Utilising the LHA/LZT range, in conjunction with the WHK, system operating temperatures of 78°C can be delivered, and at very high COPs. They are ideal for applications such as communal/district heating and schemes using heat interface units. For data to support work alongside gas-fired water heaters, condensing boilers and CHP, or SEAI approval, contact Euro Gas Ltd.

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- Sound pressure as low as 33dB
- 2013/811 EU and 2013/813 EU compliant

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The market demand for sustainable net zero carbon buildings is now increasing significantly and it's not just coming from the senior exacutives – it's now coming from the CEOs. At Passive Dynamics we believe that the regulatory environment is not pushing the agenda fast enough, and therefore it is up to the industry to take the lead. While currently much of the focus is to comply with NZEB, it is very clear that this methodology and the modelling software assessments don't go far enough to deal with the climate challenges that we will face before long. We need the regulatory bodies to clearly set out how future revisions of Technical Guidance Document Part L will go about addressing the net zero targets with key milestones every five years up to 2050.

Here we outline some of the key criteria that we feel needs to be addressed for future revisions.

The current non-domestic SBEM (Simplified Building Energy Model) is too simplified and not fit for the new complex challenges that we foresee in our industry.

1. Industry collaboration

The industry and engineering solutions are advancing fast. At Passive Dynamics we are constantly devising new innovative solutions to traditional design requirements. As an industry we need to now create the space to be open to this innovation. We need to develop this transition to a transparent, accurate performance-based approach for assessing compliance. We feel that a net zero task force needs to be set up that includes officials from the Department of the Environment, SEAI, CIBSE Ireland, Engineers Ireland, ACEI and other representatives from industry. One thing is for sure – the industry wants to help.

2. Over-simplified building energy models

Buildings and their systems are getting more complex and intelligent. The current non-domestic modelling software compliance engine SBEM (which stands for Simplified Building Energy Model) is too simplified and not fit for the new complex challenges that we foresee in our industry. If we use LEED certification as an example, a detailed energy model is required which uses dynamic simulation software. For LEED the performance curves for heat pumps, chillers, pumps and fans need to be accurately modelled and the result from this software gives more realistic "real life" outputs in terms of energy and carbon emissions.

This dynamic simulation software is also more accurate at modelling the effects of a building's thermal mass and external solar shading features such as *brise soleil* that can be used to reduce cooling loads. Dynamic simulation uses detailed geometry from 3D models, real site weather data and simulates hourly or sub-hourly intervals throughout the entire year. By analysing the energy performance in this manner, as opposed to the monthly averages calculated by SBEM, the results are much more accurate.

Using this more detailed energy model we can assess and quantify the energy performance of different design strategies and the synergies between them. It seems counter intuitive not to be permitted to use such detailed software design tools for Part L compliance. In the UK, for example, the use of dynamic simulation modelling is permitted under what they refer to as Level 5 analysis. In Ireland, Part L compliance is limited to Level 4 analysis using the simplified SBEM software. We would urge SEAI to fast-track the approval of more accurate Level 5 software methods that have been used in the UK for many years.

3. NZEB leaving design teams in hot water

We welcome the recent updates to the Domestic Part L whereby the actual water flowrate for showers

can be entered into the DEAP 4.2 software. For the Non-domestic Part L there is no incentive (in terms of the calculation results) to reduce the hot water consumption. For some building types we are finding that the "in-built and non-editable" hot water consumption values in the software are much higher than the actual design. This often results in "over design" to overcome or offset this assumed hot water demand which is not always accurate.

We see this issue occurring where a building has showers and changing facilities but, in reality, the hot water demand will be infrequent and low. For future versions of the non-domestic compliance software we would like to see a facility whereby the actual hot water demand could be entered by the energy assessor.

We feel that further work is also required in terms of the guidance surrounding district heating systems using heat pumps. For large-scale domestic or commercial projects, the vast majority of commercial-scale heat pumps do not have EN 16147 certification for the appropriate operating conditions. We feel that clearer guidance needs to be communicated by the accreditation bodies to industry in terms of acceptable approaches. The current guidance is that at least one heat pump in a domestic-scale district heating system must have EN16147 certification, otherwise a default value needs to be used in the software.

This has been very frustrating for heat pump suppliers as it becomes very difficult to develop a solution that meets the certification criteria. We feel that these ongoing issues could be holding back some innovative district heating solutions and therefore would like to see a renewed focus on this area by SEAI with more collaboration with industry.

4. Facilitate innovation – design for performance rather than just compliance

Our concerns are that Part L compliance is viewed as the end-goal whereas in reality it should become the baseline performance. There needs to be more flexibility to consider emerging innovative design solutions and, as engineers, we need to properly assess design solutions rather than allow NEAP or DEAP to dictate the easiest path to compliance.

If we are serious as an industry about achieving net zero carbon in the coming years, we need to be developing the software tools and methodologies now that will facilitate this transition. The design solutions and their performance needs to be robustly assessed akin to LEED energy modelling or the NABER's energy rating scheme in Australia. As an industry we need to ensure that the design focus remains on decarbonising buildings rather than getting consumed by ticking boxes for compliance which can then sometimes lead to a "green-washed" building asset.

The decarbonising of our built environment will be challenging and complex, but we need to be given the legislative space to come up with more innovative solutions and to be given the opportunity to demonstrate the merits of these. The first step on this journey is to be more flexible, open to new ways of doing things, and challenging the status quo.

At Passive Dynamics we look forward to working constructively with all industry partners to help improve the current compliance methods, and to get one step closer to a decarbonised built environment for us and future generations to enjoy. ■

Decarbonising our built environment will be challenging and complex, but we need to be given the legislative space to come up with more innovative solutions and to be given the opportunity to demonstrate the merits of these.

Get the lowdown on latest Grundfos submersibles

It is becoming an accepted fact that we are facing more extreme variation in our weather patterns that are impacting on our rainfall. This means more situations that will require the successful removal of non-aggressive water, drain water or grey wastewater. Regardless of whether this is in an emergency situation or is just part of a scheduled maintenance activity, these various scenarios all require the services of a submersible drainage pump to remove the unwanted water.

Below: Example from the UNILIFT KP stainless-steel family of submersible pumps.

This is where Grundfos can help as it has a great range of submersible pumps that, through their robust design and reliable operation, will support many drainage scenarios. Take for example the lightweight UNILIFT CC range that is engineered from composite materials with a stainless-steel strainer. All models are virtually maintenance free and are the preferred solution for a range of applications, including ponds and swimming pools. Their unique automatic air vent will guarantee start-up even if the pit runs dry. These pumps can also pump to a water level as low as 3mm and can be used in both mobile or permanent installations

The UNILIFT KP is a stainless-steel family of submersible pumps that are the preferred solution for a range of applications, including those involving effluent from domestic septic and sludge treatment systems. They can cope with temperatures of up to 50°C and up to 10mm solids, as well as offering automatic overload protection.

Where there is a greater demand, the UNILIFT AP is the right choice as it can cope with a flow rate of 9.44 L/s and an 18m head. Complete with all the key features that their smaller counterparts provide, these pumps also offer the option of operating with or without a manual or automated float switch.

So, no matter what the circumstance, Grundfos has a pump solution that is right for your drainage needs.

Contact your local sales rep or visit www.grundfos.ie ■

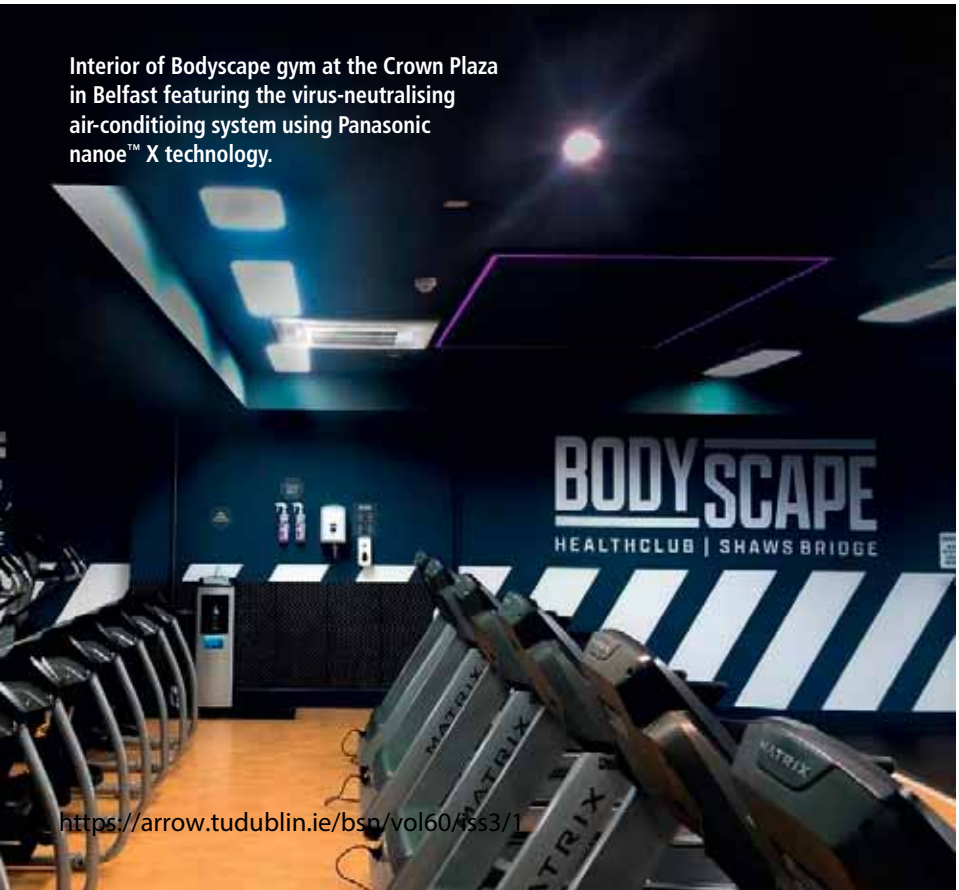
Bodyscape health club fits nanoe™ X anti-viral air-conditioning

Bodyscape Health Club has completed the installation of a new virus-neutralising air-conditioing system using Panasonic nanoe™ X technology. The health club, which is located at Crowne Plaza, Belfast, has worked with local firm Aircon Sales and Service to fit the new air-conditioning which is proven to neutralise and inhibit airborne viruses, including SARS CoV-2.

Simon Millar, Club Manager at Bodyscape said: "We always take the health and wellbeing of our patrons very seriously but especially so now as we have re-opened for business following the Covid lockdown. We already have new procedures in place and are delighted to have upgraded our air-conditioning and provided enhanced natural and mechanical ventilation to provide an even greater level of safety and comfort for members. This now provides multiple air changes per hour of fresh air into the gym area."

Neil Capes, Service Manager at Aircon, explained: "The new air-conditioning uses Panasonic nanoe™ X technology, which is internationally validated. The principle of this technology is the use of hydroxyl radicals (also known as OH radicals) which inhibit viruses and bacteria.

"Hydroxyl radicals are unstable molecules looking to react with other elements like hydrogen and to capture it. Thanks to this reaction, Hydroxyl radicals inhibit the growth of pollutants such as bacteria, viruses, SARS CoV-2, moulds and odours, breaking them down and neutralising the unpleasant effects. This naturally-occurring process has major benefits and significantly improves indoor environments.



Interior of Bodyscape gym at the Crown Plaza in Belfast featuring the virus-neutralising air-conditioing system using Panasonic nanoe™ X technology.

The effectiveness of nanoe™ X technology has been tested by third-party laboratories in Germany, Denmark, Malaysia and Japan and has been found to be 99.7% effective in inhibiting airborne viruses."

As we went to press Panasonic held a virtual, worldwide press conference where leading experts from independent international research/test houses gave detailed insights into nanoe™ X technology and its effectiveness in creating healthy indoor environments. The conference brought together high-level company executives associated with the air purifying technology, including Akihito Hirohata from the inventor's lab, the Panasonic nanoe™ X R&D team, plus the independent scientists behind the test result.

"An important feature of nanoe™ X technology," says Vincent Mahony, National Account Manager, Panasonic Ireland, "is that air purification occurs outside of the air conditioning unit by actively propelling hydroxyl radicals into the room. This proactively inhibits certain bacteria, viruses and smells where they occur and doesn't fight them only when being drawn into the aircon unit itself.

"This is a different method compared to devices that neutralise air passing through the devices, and which require periodic filter cleaning to maintain the claimed properties. The fact that these particles can then land on surfaces and penetrate textiles to reduce the odours, and inhibit bacteria, mould and certain viruses, is a game changer," he concluded.

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Wilo water quality systems ‘Sustainable Focus’

The treatment of water in closed heating and cooling systems is crucial for avoiding harmful microbiological fouling, corrosion and scale in the system. These result in unpleasant sounds in pipes and radiators, but also cause energy waste, poor system performance and reliability. It inevitably leads to early replacement of the plant and the components. Therefore, water quality/efficiency is a central topic in building services.

Wilo Sinum, ideal for pressurisation, de-aeration and topping up in sealed heating and cooling installations.

Wilo water quality systems deliver a constant pressurisation, de-aeration and topping up in sealed heating installations (acc. to EN 12828) and chilled water (cooling) installations. They use innovative and proven technology – such as coalescence and flow velocity reduction – to remove air and solid particles from the water. Whether a domestic application or commercial installation with large heating or cooling systems, the Wilo series of pressure-maintaining systems, degassing automats, air and dirt separators and automatic air vents provide the most efficient solution.

Wilo-Sinum “fill and spill”

Wilo-Sinum is the ideal solution for pressurisation, de-aeration and topping up in sealed heating and cooling installations where standard diaphragm expansion equipment is limited. The system offers continuous degassing using three selectable operation modes and, thanks to the digital and analogue inputs, it can be optimally integrated into an existing building management system. The large series of closed vessel sizes allows adaptation for a wide number of applications across all market segments.

Key benefits

- Easy installation thanks to intuitive menu navigation, large display and self-learning microprocessor;
- Different operating modes guarantee continuous degassing;
- Advanced technology ensures low power consumption, long service life and easy maintenance;
- High convenience through volumetric controls and automatic topping-up during the heating and cooling cycles;
- Modular design for a high level of installation flexibility;
- Optional: Integration into existing building management systems through digital and analogue outputs.

Digital CPD Training

Wilo Ireland is currently undertaking an extensive digital CPD programme on these topics that is proving extremely popular and generating a great deal of interactive discussion. It is freely available to all consulting engineers, contractors and end-users

“It is encouraging to see the marketplace in Ireland so aware of, and embracing, the importance of system efficiency,” says Derek Elton, Managing Director, Wilo Ireland. “The elimination of air and solids in heating systems ensures maximum operation efficiency and energy transfer/usage. It is also in line with Wilo’s sustainability commitments and its selection as one of the 50 Sustainability & Climate Leaders in the world.

“This trend towards heating system efficiency will contribute greatly to reducing Ireland’s energy use and carbon emissions, and the role of high-efficiency, digital pumping equipment is a critical element in the success of this initiative.”

Contact: Wilo Ireland.
Tel: 01 – 426 0000;
email: sale.ie@wilo.com ■

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- Desktop or Wall Mountable
- Anti-tamper Wall Bracket Supplied as standard
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What's included:

- Vision CO2 Monitor
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- 2m USB Cable (White)

Free PC App Allows:

- Traffic Light setting configuration
- 7-day historical data to be viewed
- Temp & RH Readings to be disabled
- Manual Calibration

Dimensions:

Standard: H:84 mm x W:84 mm x D:34 mm
With bracket: H:84 mm x W:88 mm x D:40 mm

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ARISE and embrace CERTcoin

The innovative crypto currency for skill development

Belfast Metropolitan College has been appointed project lead for another EU Horizon 2020-funded project aimed at the construction sector. Called ARISE, this new project involves nine European countries, including TU Dublin as the Republic of Ireland partner.

This new project is an evolvement of the last BIM (Building Information Modelling) project and its BIM modules that Belfast Met also took the lead on (see page 38 this issue). ARISE's mission is to support the twin transition of the construction sector and to contribute to the *European Recovery and Resilience Plans 2021-2027*, by providing the construction sector workforce with the digital and sustainable energy skills of the future.

ARISE will revolutionise the learning process by monetising skills development and learning exchange with a digital system based on skills recognition rather than accreditation. The training and transaction system developed by the project will reward learners as they achieve competence at a certain level with the crypto currency for skills exchange – CERTcoin – the innovative currency of skills and learning of the construction sector embracing today's digital transformation benefits.

This reward based on skills and time credits will be stored in an Individual "Learning Account" and can be used, for example, as digital points accumulation in a skills barometer or for exchanging into valid certificates. It will be an easier, accessible, less time-consuming and still competitive way to upskill blue and white collars, as well as the market-demand side in public administration, clients and owners

ARISE will apply digitalisation both as a learning method and as a framework of job-based construction skills of the future, multiplying the effects of the green transition skills. The novel training method will make the learning process attractive and effective, facilitating its accessibility through a mobile (smartphone) and a user-friendly, web-based platform. The intervention/ learning progress will be achieved in a scalable way, in bite-sized skills delivery.

ARISE will apply digitalisation and the earning of learning credits in a "step by step" recognition of competences, as an accelerator to empower demand for sustainable energy skills in the construction sector, and as an enabler of formal certification. This system will be employed based on blockchain procedures to instil transparency and trust.

Paul McCormack, Belfast Met Innovation Manager and ARISE Programme Manager said: "ARISE utilises a circular economy approach specifically utilising digital skills stimulation and delivery across the entire building lifecycle and assets to decarbonise the complete energy cycle. This approach harnesses the market drivers from the demand-side, and matches these with impact- targeted strategies and objectives required to achieve comprehensive success. It is a pioneering training scheme and a powerful socio-economic cross-sectional influencer, affecting the multiple sectors of education, industry, market and policy." ■

Below: Paul McCormack, Belfast Met Innovation Manager and ARISE Programme Manager.

Smart Heating Technology

FläktGroup Ireland has been a Siemens distributor for over 20 years. The RDS110.R Smart Wireless Thermostat is for the control of heating applications in apartments, family homes, and other residential types, as well as light commercial spaces. This state-of-the-art technology has a highly-accurate temperature measuring element and a self-learning algorithm that delivers high-quality control performance. It has an air quality indicator and the ability to find the perfect room climate while guaranteeing energy optimisation and a reduction in costs. In addition to achieving these goals, the RDS110.R Smart Wireless Thermostat offers many other exclusive features which proves that it fully understands and reaches specified needs.

Smart Building Automation

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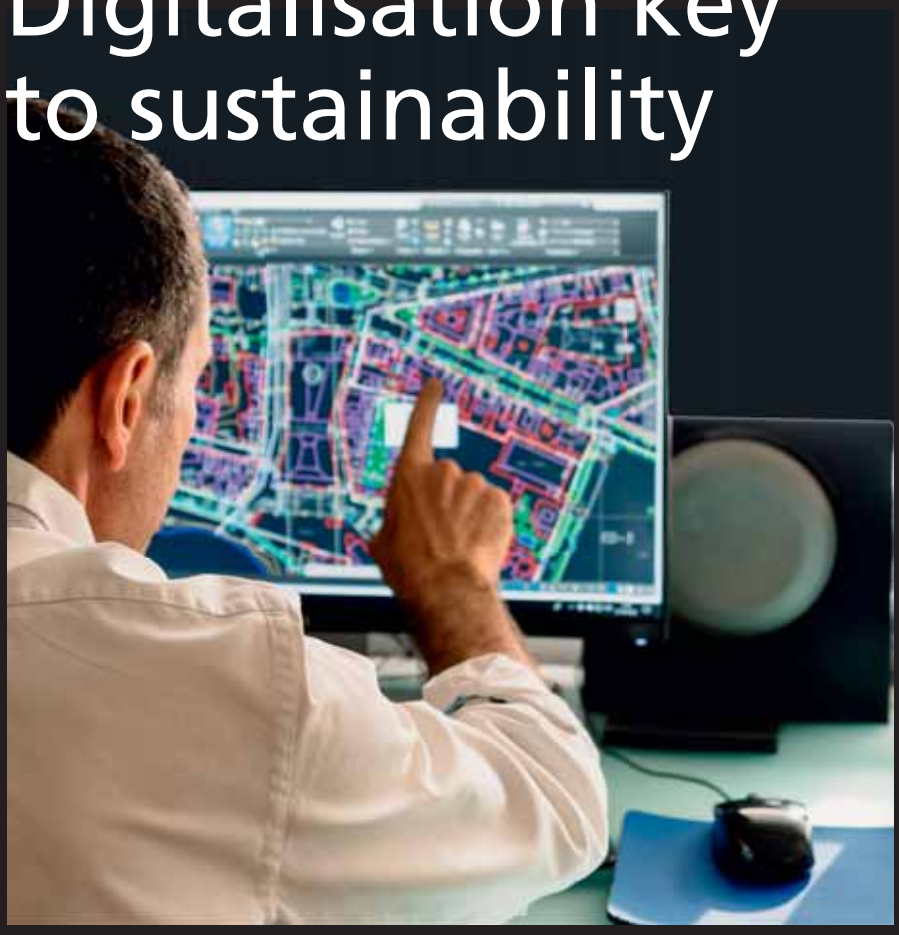
Digitalisation key to sustainability



Technological University Dublin, in partnership with Belfast Metropolitan College and an EU-wide consortium of partners, has secured funding for another EU BIM project to improve market demand and increase the energy performance of buildings by unlocking the huge latent potential of the construction workforce through stimulus and reward.

Digitalisation is a game-changing strategy that will empower the construction sector to thrive and deliver the expertise for sustainable energy skills. This will be the tool to stimulate demand. There is a direct correlation between digitalisation and energy efficiency as highlighted in the IEA energy efficiency conference in June 2019.

The project partners will stimulate and contribute to increasing the number of skilled building professionals and trades people by designing and introducing a certification scheme of digital construction skills, leveraging symbiotic with sustainable energy skills, delivered digitally, in an easy and accessible way.

The ARISE project (see Page •• this issue) builds on the previous BIMcert and other BIM-specific work developed and delivered by TU Dublin, Belfast Met and partners. Capitalising on the outputs and result of those, it will create and deliver a more complex, complete and integrated training scheme. This will combine the results, frameworks and materials previously developed, and continue its evolution as well as deeper and further consolidated actions towards raising the uptake of these skills modules.

Upskilling and appropriate certification will be tailored for professionals and other participants (public administration and policy makers, owners, facility mangers) and for different construction activities such as new and renovated buildings. Certification will ensure the identification of "new skills" that should be added in the national qualifications to align them with the new requirements of the building market.

This work is part of a wider EU group BIM Energy Performance Alliance (BIM-EPA) which is creating a digital library of tools, modules and blended materials to deliver in-built environment energy performance. BIM-EPA is a collaborative partnership with an EU-wide reach incorporating approximately 100 partners across 24 EU countries. It also partners with the EU initiatives Building SMART and Build UP. The Alliance seeks to inspire demand for sustainable energy skills by providing clear upskilling transactions and recognition of upskilling performed in the digitalisation of the construction sector.

One of the key aims of BIM-EPA is to create digiCONEX – an EU-wide digital centre of excellence for the construction sector. This will establish a "Skills Hub" which will explore the future of skills in the built environment and the ways in which we can encourage new entrants into the industry. This will promote and enhance the use of digital skills in the construction sector by sharing knowledge, best practice and collaboration to inspire and showcase new opportunities in digitalisation of construction. Through BIM training, accreditation and digital certification, digiCONEX will support smart construction in the form of offsite manufacturing, digital technologies and high-performance buildings.

Over the next six issues *Building Services Engineering* will feature a series of six articles on digitalisation, commencing overleaf with Digitalisation in the Built Environment, and to be followed by BIM Basics; Digital Transformations; The Need for Upskilling within the Industry; The Benefits of a Digitally-informed and Empowered Workforce; and Stimulating the Demand for Skills. ■

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Think smarter with smart technology

FläktGroup Ireland has been distributing Siemens heating products throughout Ireland via local wholesalers for over 20 years. The extensive product range caters for all applications with innovative solutions designed to suit specific market needs.

The current Covid pandemic has presented new challenges with a dramatic switch to home working across all business sectors. With more and more people being vaccinated, the talk now is about improving ventilation and air quality in commercial buildings to accommodate a safe return to the workplace.

However, many will still continue to work from home when we emerge from the pandemic and so Siemens has turned its focus on health and wellbeing in the home workplace. The priority of any residential controller is to maintain a comfortable ambient temperature and to achieve this in the most energy efficient way. However, apart from temperature, sensing and controlling other parameters is equally important.

The Siemens RDS110 smart thermostat supplied by FläktGroup Ireland has a highly accurate temperature measuring element and also boasts a self-learning algorithm which delivers high-end control performance. Once installation and the set-up is complete, it then learns the characteristics of a room in less than one day. The "Optimum Start" control defines the ideal moment to start heating to have a perfect room climate. The results are convincing: energy and cost savings and an improved climate comfort are all delivered.

In addition to its temperature measurement function, the Siemens RDS110 smart thermostat has an in-built sensor which monitors air quality. Even for simple tasks such as listening and absorbing information, it has been found that peoples' performance increases by a significant factor of 1.5 when air quality is improved. For tasks that require higher levels of involvement, such as taking the initiative, the measured performance increased by a sheer factor of 10. FläktGroup knows this level of performance is just as important when working from home as it is in the workplace.

The device also has a built-in relative humidity sensor. The measured value is displayed on the screen. Studies show that, if this value is kept between 40-60%, the spread of cold and flu viruses can be reduced by up to 70%. This information is also displayed on the App that works with the device. So, when advising clients on controls for the home, don't let temperature be the only factor. Consider all the other factors that will ensure the best working and living environment … and think smart.

FläktGroup understands the importance of indoor air quality and how it makes a substantial difference to peoples' health, comfort and productivity. In the Siemens portfolio it has a suitable solution for every application.

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M: 086 – 604 4232;
E: Alison.Murphy@flaktgroup.com

RESIDENTIAL AND COMMERCIAL

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FlowStop also has the option to add leak detection sensors in vulnerable areas within a property such as kitchens and utility rooms, or other areas with running water such as bathrooms, toilets and sinks.

Discreet wall unit: warning LED flashes red when the system is activated.

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ANDEL

Blockchain Security Technology in Building Automation

With the rise of Bitcoin, the digital internet currency, blockchain technology has suddenly become more than just hype. Internet giants are planning their own digital cryptocurrencies and threatening the traditional world of key currencies and banks. Alongside these megatrends, SAUTER is taking a different approach and is aiming for a more "peaceful" use of blockchain technology – to protect the data and processes used in building automation.

A blockchain is a decentralised database that maintains a steadily-growing list of records. With Bitcoin, this database is extended with every transaction, thus building a chain that is constantly having new elements or blocks added (hence the term blockchain). When a block is complete, a new one is created containing the digital fingerprint of the previous block. If someone deletes only a single element in this data blockchain, the fingerprint of the affected block changes and thus the whole blockchain breaks up into the individual links of the chain.

A special feature of Bitcoin is that each transaction is checked again before it is written to the blockchain. This validation and viability testing process is extremely CPU-intensive. Research shows that Bitcoin cryptocurrency now requires around 46 terawatt-hours of electricity per year for its computer operations, resulting in annual emissions of about 22 mega-tonnes of carbon dioxide.

SAUTER also deploys blockchain technology but in its own unique way – linking its automation stations in a building network and creating a blockchain ring. The computing resources used and the extra communication data that results are extremely modest. There is no such excessive power consumption, just an increase in data security!

Cybersecurity in the age of IoT (Internet of Things)

SAUTER has described the security levels attained by **modulo 6** for networks and system components in *modulo 6 Guideline for Cybersecurity*. This specification allows the current security level to be determined for plants that may require special protection and, if required, to increase these through targeted measures.

SAUTER
Creating Sustainable Environments.

SAUTER is aiming for a more "peaceful" use of blockchain technology – to protect the data and processes used in building automation.

Blockchain ring formed by automation stations

modulo 6 has had a high level of protection built-in from the beginning. The automation station offers a completely separate network interface from the building network. This creates a type of firewall between the internet and building network. Encryption, authentication and access protection are guaranteed and the network interfaces are already well protected against DOS attacks at automation level. Therefore, processes can be observed, limited, isolated or even stopped if needed.

When we think about the Bitcoin and blockchain principle, we initially visualise the security of data transactions or payments. Beneath this dynamic transaction level, however, is a static, distributed blockchain-secured database – a kind of "ledger set in stone of all existing transactions". SAUTER is now translating this principle into the world of networked building automation and developing its own blockchain process.

The idea is simple – The static data of the automation stations in the network form a kind of blockchain ring. Each automation station generates its digital fingerprint. This is based on its own data and on a fingerprint of the previous station in the blockchain ring. The block data typically consists of programs, firmware and process and network parameters. Simply put, each station uses its own data to form a block in the blockchain. If the integrity of the data in a station is infringed (deleting or changing a single bit is all that it takes), the blockchain collapses immediately.

In the event of a breach of the blockchain's integrity, SAUTER's system responses are:

a) Trigger an alarm;
b) Trigger alarm and isolate affected station (and assume emergency signal state, for example);
c) Trigger alarm, isolate affected station and initiate automatic self-repair.

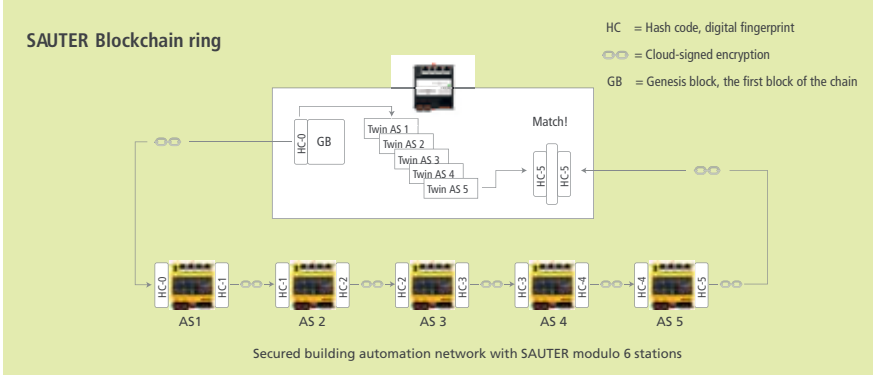
Action c) requires the creation of a digital twin for every station during commissioning. These twins (a copy of all static data) are saved in an encrypted database. They can then be stored on a dedicated automation station, local computer or in a data centre/ the cloud.

An advanced procedure for the SAUTER blockchain allows us to distribute the twins randomly among the existing stations. This completely negates the need for an additional database computer.

The self-repair process is particularly useful, especially during routine servicing. If an automation station is replaced, the data validated during commissioning is guaranteed to be transferred uncompromised.

Sirus BMS engineers are on hand to discuss the suitability of SAUTER modulo 6 for your building automation project.

Contact us on 01 - 460 2600 for details.



Secured building automation network with SAUTER modulo 6 stations

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Digitalisation in the built environment

Author: Paul McCormack,
Belfast Metropolitan College Innovation Manager

As we all recognise, the COVID pandemic has accelerated digitalisation in the workplace and the operational/implementation "gap" within the construction sector is widening. The objective now is to address this gap to inform and enable a new "division" of labour to stimulate demand for energy efficiency skills.

The construction sector has always operated in a remote-work environment. Our digital transformation skills, and especially BIM, are specific remote-working tools that allow the workforce to thrive. Designed to provide the right digital infrastructure and deliver the energy efficiency skills needed for green construction, BIM uses technology to decentralise and redistribute worker tasks, enabling and equipping workers with the skills to achieve energy efficient construction.

Irrespective of the restrictions imposed by the current Covid pandemic, workers in the construction sector have always had to possess an on-site capacity and remain operational and productive. This challenge is now reflected across many other sectors and there is an opportunity to share experiences and collaborate, especially in skills and training access. The pandemic has shone a light on the challenges that the construction sector has faced for many years, namely, how to meet the demands of an increasingly-digitalised world and how to embrace the challenges and opportunities of a remote workforce.

Digital leverage

- Nearly 90% of global business leaders recognise the critical importance of adopting intelligent automation;
- 70% of construction companies believe that those who do not adopt digital tools will go out of business.

The challenge is to mobilise the skills exchange within the workforce in the built environment to address digital transition and empower the sector. Key objectives are:

(1) To transition to this "digital workforce";
(2) To optimise the opportunities presenting themselves;
(3) To deploy the digital workforce at scale;
(4) To overcome "digital dissonance".

It's time to challenge conventional thinking on the future of education in terms of digital transformation and organisational change and to transform content, delivery and recognition to meet industry needs. Some institutions "get" social media, there's a holistic approach to digital engagement that spans the entire organisation.

For institutions and industry without intentional and authentic digital leadership, the learning experience is scattered and lacks direction.

Key hurdles for the construction sector to overcome include:

- How can industry truly get digital and provide an organisational push for ongoing digital transformation;
- How can you use social media to enhance the student experience and encourage industry digital champions?

Digitalisation can be disorientating. Standard contexts and work processes that we are all used to are changing – technologists call this "context collapse". However, on the other hand, digitalisation is recognised by those who are implementing it as a powerful enabler to enhance the effect of their work and as an enrichment of their professional skills. Social interactions and our workplaces are changing and will change further. This is also the fact for upskilling interventions. Due to digitalisation, learning will become easier to access, digest and utilise.

Environmental leverage

Buildings account for 17.7%[1] of global greenhouse gas emissions:

- Residential 10.9%;
- Commercial 6.6%.

This equates to 8.74billion tonnes of CO_2 equivalents (CO_2e).

In order to tackle these challenges we must equip the workforce with the necessary skills to enhance low-carbon construction. Governments, particularly in the EU, are increasing their CO_2 reduction and energy efficiency regulations and raising the bar. EU strategies and policies for decarbonisation of the construction sector and approaching NZEB are being established.

Digitalisation empowerment of the workforce goes hand in hand with energy skills and provides a great opportunity to reduce the environmental impact of construction projects. This approach makes the energy skills of the construction workforce more effective, easier to improve, and provides confirmable effects in rational and smart use of materials and energy. "Together with renewables, energy efficiency is one of the mainstays of global efforts to reach energy and climate goals. While our recent analysis shows encouraging momentum for renewables, I'm very concerned that improvements in global energy efficiency are now at their slowest rate in a decade," says Dr Fatih Birol, the IEA Executive Director.

Skills leverage

Most of the issues related to a low demand for a skilled workforce are due to the unavailability of widely-recognised and accepted international schemes of certified qualifications for sustainable construction and sustainable energy skills. Other barriers include a lack of awareness and uptake by the industry of new methods and digitalisation, and the lack of mandate or incentive by public authorities for the use of such skills.

Educating the workforce in digital skills will stimulate demand by developing and implementing a digital transformation skills roadmap for the construction sector. Both public and private owners need to be involved in the definition of the roadmap as they are the drivers of the innovation. This education process will stimulate demand by enabling participants to share and amplify content online. It will also allow them collaborate digitally and become impulsive about their sustainable energy skills.

The formerly called "bricks and mortar" industry has entered the digital age. The digital push is accelerating and, even if construction industry players are still confused and hesitant about the change and new technologies, the time has come for them to develop their digital skills in order to achieve and make their sustainable energy skills more effective.

Society is in transition, leaving behind the old energy ineffective, material-wasting and not always healthy built environment. We're moving towards an energy efficient, healthy and sustainable built environment. At the same time, digital technology is transforming our lives at an accelerating pace.

Conclusion

Digital transformation isn't new, but the construction sector as a whole has been hesitant to accept the digitalisation process. In order to stimulate demand for sustainable energy skills in the sector we must work across the entire construction supply chain. We must embrace the digital transformation process, together with sustainable energy skills.

Companies must empower their staff, enable them to design a digital transformation roadmap for their sector, and stimulate demand for sustainable energy skills. This roadmap will result in a digital workforce and create a culture within the construction sector that is digital ready. ■

"Digitalisation is recognised by those who are implementing it as a powerful enabler to enhance the effect of their work and as an enrichment of their professional skills.

References

1. Source: Climate Watch and the World Resources Institute 2016 when total emissions reached 49.4 billion tonnes of CO_2 equivalents (CO_2e)

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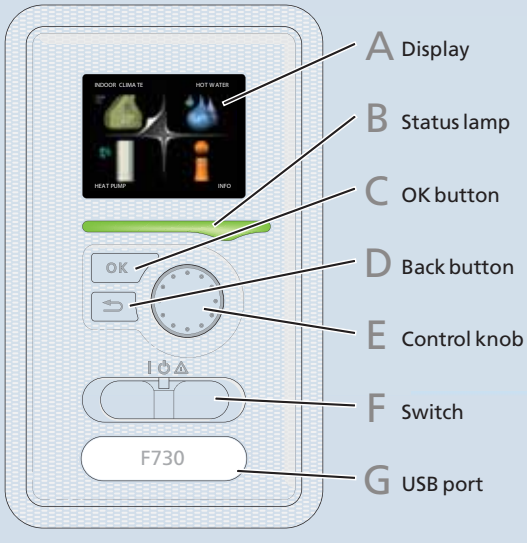

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Andel FlowStop mains water shut-off from Manotherm

Andel FlowStop is an automatic mains water shut-off system suitable for all types of application including domestic installations, student accommodation, hotels, offices and commercial premises. It monitors water supply and automatically shuts it off in the event of unusual flow activity, or where there is a temperature drop and the risk of freezing pipes.

More and more insurers require that properties have a mains water leak and flood prevention system in place and Andel FlowStop is the ideal solution. It is a cost-effective and easy-to-install automatic mains water shut-off system, offering 24-hour protection against internal leaks and floods.

With FlowStop, there is also the option to add leak detection sensors in vulnerable areas within a property such as kitchens, utility rooms and other areas with running water such as bathrooms, toilets and sinks.

The WRAS-approved system is fully automated and is ideal for residential properties because it can monitor and manage up to two mains supplies. It is also the perfect solution for properties with both a hot and cold mains supply such as residential apartments, student accommodation, hotel rooms, offices and other commercial units.

The FlowStop system includes a sleek, discreet wall-mounted control unit and up to two FlowStop valves, plus an additional solenoid valve for the return flow if required. The sleek design is a double-gang faceplate that blends into any décor and units can be located in any convenient place, in a cupboard or mounted on the wall near the valves.

Colour code:

- **Valve – FlowStop can manage and monitor up to two mains supplies.**
- **Control Unit – Discreet wall-mounted double-gang faceplate control unit.**
- **Leak Sensors – A range of optional leak detection sensors are available.**

FlowStop features

Freeze protection: Turns the water OFF if the temperature falls below 1-5°C (user adjustable);

Time-out protection: Turns the water OFF if water has been running for more than 10-60 minutes (user adjustable);

Excess flow protection: Turns the water OFF if the system senses that there has been a burst pipe or there is an abnormal flow of water between 10 and 40 litres per minute (user adjustable);

24-Hour non-use protection: Turns the water OFF if no water has been used for 24 hours;

Reset button: Resets the system and allows the mains water to flow again.

Control unit features

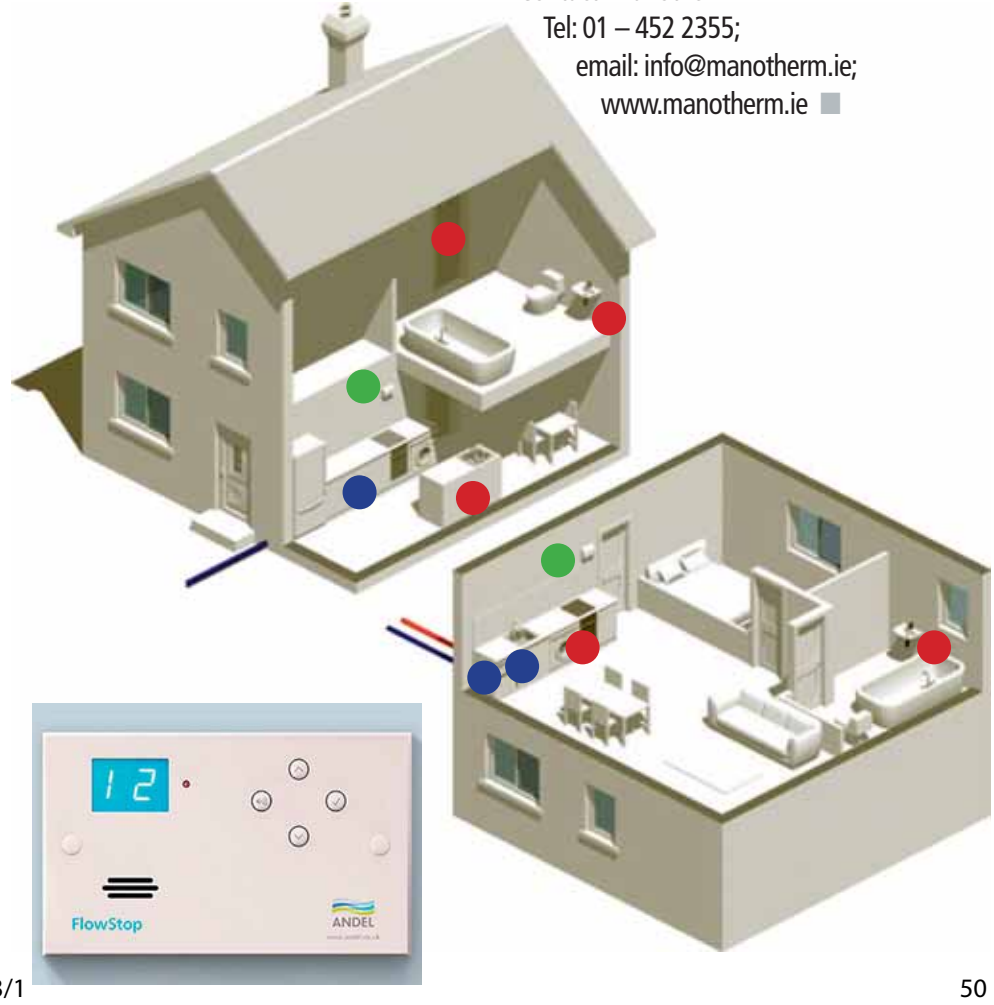
Faceplate: Discreet double-gang faceplate featuring 2-digit LED number display, red LED warning light and four navigation buttons for easy set up. Can be surface mounted or flush mounted using a standard back box;

Override feature: Turns the monitoring off to allow for prolonged water use such as watering the garden;

Additional leak detection sensors: Can be added to detect leaks in vulnerable areas such as underneath washing machines and dishwashers, as well as in bathrooms and toilets (optional);

Output: Volt-free relay contact rated 30V@1A per input.

Contact: Manotherm.
Tel: 01 – 452 2355;
email: info@manotherm.ie;
www.manotherm.ie ■



Digitalise job management to help your business grow

Businesses in the building services sector are increasing efficiency and growing their business faster by trading outdated manual processes for new digital technologies. At the top of the list? Cloud-based job management software that streamlines project, service and maintenance workflows in one end-to-end solution.

Harnessing this technology and its mobile features lets you access the most accurate and up-to-date information pertaining to project progress, billing and invoicing, scheduling and dispatch, inventory and more, all from one central location. This eliminates wasted time spent linking essential data from disparate sources, gives full visibility into your numbers, and streamlines communication from the office to the field.

So how does digitising your operations help your business grow? Here are the top benefits of cloud-based job management software.

Streamlined team management
With all information accessible in the cloud, teams are able to view real-time awareness of job progress and location of field staff, in turn, enhancing job scheduling capabilities. You can make scheduling changes as they happen, closing gaps and keeping your team productive.

Improved productivity
Field staff can access job information, site history and request inventory without returning to the office. Any updates from the field sync in real-time via a mobile app.

By giving your team the information they need, when they need it, you reduce travel time, increase productivity and expand capacity to find new revenue streams or take on new jobs.

Clear and effective communication
Communication between office and field should not end once a job has been dispatched. It should be ongoing and instant, enabling efficient processes and a seamless experience for the customer. Cloud-based job management software streamlines all communications in one easy-to-access portal.

Optimised business management
Investing in software to digitise your business leads to reduced overheads through automated workflows, centralised data and integrations with third-party applications.

In the office, replacing manual, time-consuming tasks such as data entry with automated workflows frees up resources to focus on value-adding activities and minimises errors.

Clearly identify where you are making/losing money
Capture all of your data from each job, in one centralised location, accessible from anywhere. You can also clearly identify where you are making and losing money through job costing and profitability reporting, and use collected data to optimise workflows, analyse the profitability of customers and inform hiring decisions.

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Digital Twins – weaving the 'Golden Thread'

Digital twins are set to usher in a new and exciting digital era, with retail, manufacturing, and housing set to reap its benefits. Asite explores the foundations required for a digital twin, specifically focusing on the "Golden Thread" of information, in a new report examining the foundations required to build and implement a valuable digital twin.

Responding to the integral role digital twins are set to play in ushering in an almost prescient digital era, the report, entitled *Digital Twins: Weaving the Golden Thread*, focuses on the idea of the golden thread of information and discusses the requirements necessary for its maintenance.

The report also details how organisations can best position themselves to optimise the implementation of digital twin technology – namely, by embracing openness, collaboration and interoperability.

Nathan Doughty, Asite CEO said: "In fluctuating and increasingly uncertain times, digital twins can provide the built environment with a level of predictability and certainty that we need to remain resilient.

"For digital twin technology to realise its potential, we need a common open platform that will allow us to send, receive, capture, store and share structured and unstructured data. This will help us to collaborate without barriers – and specifically, without vendor lock-in or proprietary software.

"The Asite Platform connects our growing ecosystem of partners through standardised interfaces, consolidating our strengths to unlock everything digital twins have to offer."

Global digital framework

Identifying some of the issues currently holding digital twins back – specifically, data fragmentation and lack of openness – the report proposes a global digital framework as a solution. Establishing how data is used, maintained and shared would facilitate free sharing and interpretation of data and insights, create an accurate record of a project, and provide the optimal conditions for digital twins to thrive.

Nathan Doughty , Group CEO Asite Platform.

Essentially, Asite has been at the forefront of digital innovation for many years, helping connect the physical, digital and human.

Asite's goal is to create a truly open platform for everyone where reliable insights can be used to solve global issues. Digital twins are the apex of this journey. Asite's objective is to facilitate digital twins by enabling the flow of information between systems and creating a network of digital transformation partners. ■


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The Renovation Wave – an opportunity to be led by building services

For many years the building services engineer has stood almost invisible behind the architect/projects manager in the design team hierarchy. That was the natural order and our substantially hidden input into buildings perhaps only warranted that profile, writes *Daniel Ring (right), Managing Director, Lawler Sustainability.*

However, the world has changed significantly over the past number of years, evolving from failed blue and red arrows explaining to clients the magical movement of air through their buildings, to a more technical and analytical approach to building performance.

We have seen the importance of building physics and simulation grow in terms of informing building envelope design. This importance increases as this newly-developed science is supported through legislative compliance requirements. It has certainly provided a more important role at an earlier stage in the building design process for engineers than had previously been the case. We now have a new sector within our discipline driven by highly-qualified engineers. This evolution continues apace as we look at the power of new technology, combined with BIM, in establishing virtual mirrors of actual buildings – the digital twin.

This requirement for analysis and energy modelling creates a really great opportunity for the engineer when coupled with our older skillset of engineering systems design, procurement, project management systems and building handover/ commissioning.

The National Renovation Strategy for Ireland describes this challenge as "more than 1.6 million homes, 109,000 commercial buildings, 10,000 buildings in the public sector and another 4,300 industrial sites". This is an opportunity that sits outside traditional new-build/refurbishment work streams. Consultants, contractors and FM companies with design and commissioning knowledge are all well positioned to take a lead role in the required renovation revolution.

The ability to assess building fabric/ thermal performance and buildings' engineering systems, combined with our knowledge of renewable and smart technology, gives us a really important position. In particular, we have found that the design knowledge we hold and an ability to challenge existing operational strategies has allowed us to extract maximum efficiency from existing buildings. The architects of energy consumption through our designs, we are best positioned to understand, challenge and layer the technology improvements of today on yesterday's building stock.

We have found that, as engineers, we are best positioned to manage the technical elements of this process. However, to remain front and centre, and to create the momentum required to achieve the ambitious goals laid out within EU and national policy, we will not do so with our traditional skillset alone. We must develop some complementary skillsets if we are to avoid being hired from the neck down!

Firstly, we need to revisit current sales, marketing and communications models and adopt language that is non-technical to present clear and

Eden Bleu Resort – Sustainability Strategy is saving €50,000 per year in energy bills.

compelling business cases. What effectively we are offering is a business proposition, one that unlocks a hidden revenue stream that can immediately lower costs and increase profits in commercial businesses. We need to be able to present (where required) financing solutions for clients, along with the technical solution.

So, similar to our elevated role in building performance, we must now take not just a key role but the lead role in accelerating this transition. We see this as a huge opportunity closely aligned to our existing businesses. However, it needs to be given separate focus and structure to really capitalise on the challenge and opportunity that exists.

In this leadership role we need to be actively involved in capacity building within the sector. We must engage with our educational institutions to ensure we have sufficient skilled professionals and trades. Continuing to innovate and collaborate with colleges in R&D activities must also be part of our role. Engineers need to be the voice of the industry when dealing with national agencies, and to lobby government and advocate for a change of pace and greater ambition.

We have an immediate potential customer base in our existing customers where often strong relationships and trust exist. We have full understanding of their existing engineering systems and therefore are really well positioned to help them. It is also an opportunity that has the potential to add great resilience to our businesses, and to further unlock great indigenous business opportunities in Ireland's green economy.

This is a project of huge scale and for many of our existing buildings the challenge of fabric upgrades is part of this journey. These can be a less palatable proposition than engineering systems but, nonetheless, require addressing. It is refreshing to hear Minster Ryan speak of 40-year paybacks on energy investment (district heating) and I think this mindset adjustment, and the delivery models that allow contractual and financing arrangements to be put in place, are going to be crucial to this huge transition.

Dublin City Council – Energy Performance Contracting is saving €1.5 Million across three leisure centres.

We also need to be proactive in bringing about this mindset change. This includes switching peoples' thinking from financial burden to a transition that will bring improved comfort and health, retard global warming, create employment and unlock hidden revenue through efficiency. This is aside from our moral duty to our children and the planet.

There is a real need to create a one-stop shop as a delivery model. The journey required must be mapped at an organisational, portfolio and building level. Once the plan is outlined we need to ensure that it is delivered in partnership and with speed.

By way of experience sharing and hopefully encouragement, Lawler Sustainability has challenged itself to offer a diverse range of services, from sustainability strategies such as our work with Eden Blue Resort, Seychelles which resulted in project development and delivery saving the hotel €50,000 per annum on energy bills, and the upgrade of engineering services to Cork City Council – LeisureWorld to achieve a record 50% savings on site.

We have created new opportunities and business models, and engaged in EU research projects that give an early lens on technological and legislative changes. This includes the NOVICE project looking at using combined revenue streams to reduce payback times and, more recently, SmartSPIN looking at performance-based contracting in the commercial rented sector. We have also entered energy performance contracts (EPC), notably Dublin City Council, where the simple proposition is of energy savings funding energy investment at no cost upgrade for clients. In our first EPC with the council, we upgraded three of their leisure centres resulting in €1.5 million savings and 42% in energy reduction.

I feel this is a pivot that many engineering companies in the construction sector can make. It is needed from a climate action perspective and to help develop the green economy. Clearly, and perhaps selfishly, it is an opportunity to expand and diversify and create more resilient businesses.

Engineers have seldom, if ever, been faced with an engineering project of this scale, and one that offers environmental and societal benefits that also offer considerable opportunities. We must diversify, innovate and grow to take full advantage. ■

Core celebrates SILVER JUBILEE with new beginning

While many companies mark important milestones with a celebratory retrospective theme, Core Air Conditioning Ireland has marked its 25 years in business with fresh investment and the unveiling of a strategic development plan firmly focussed on the next 25 years.

Company founder Austin McDermott has taken on the role of Executive Chairman while Dave Clarke has been appointed Managing Director and Steve Wood Sales Director. Both Dave and Steve were already part of the Core senior management team but now their respective roles will entail even greater responsibilities since joining the board.

In a lot of ways it is a case of more of the same … but even better!

Austin McDermott and the entire team at Core are justifiably proud of the market-leading position the company now enjoys within the building services sector, and especially its ability to devise and deliver quality heating and air conditioning solutions for data/computer room, commercial, pharma, process and industrial applications. However, conscious of the evolving marketplace, coupled with the impact of innovative technologies and regularity controls, Core's objective is to provide guidance and leadership in shaping the future of the industry.

"Sustainability, energy saving, carbon reduction and renewables are the current buzzwords," says McDermott, "but sometimes common usage and

Steve Wood with Austin McDermott and Dave Clarke.

> Conscious of the evolving marketplace, coupled with the impact of innovative technologies and regularity controls, Core's objective is to provide guidance and leadership in shaping the future of the industry.

familiarity with such terms diminishes their meaning and lessens their significance. The solutions we provide don't just deliver to the spirit and idealism of these objectives but have very real substance. They also take account of, and are very much in keeping with, the aspirations of Ireland's Climate Action Plan and those of the EU's Green Deal and Renovation Wave initiatives. In this way we ensure that clients are regulation compliant and can deliver on their corporate responsibility objectives."

Steve Wood echoes these sentiments and highlights why Core can deliver to such high ideals. "Core Air Conditioning Ireland has strategic partnerships with global market leaders such as Carrier, Vertiv and Novair, and can bring a wealth of multi-national strength and experience to bear on the Irish marketplace. Their respective product portfolios are vast and we combine these with the strengths of our own highly-qualified technical support team.

"In addition to commissioning and trouble-shooting, we also deliver customised maintenance packages. These ensure the optimum performance of installed systems, prolong equipment lifespan and prevent the consequences of system failure and facility shut down. After a thorough site survey an application-specific solution is devised. In addition to service, repair and maintenance, diagnostic and proactive recommendations for facility improvement are also provided. A key strength is that our team of engineers has wide-ranging experience across all HVAC equipment, covering all brands, so we offer comprehensive solutions taking in all equipment types."

Being aware of bigger-picture, all-industry developments is another essential ingredient of the solutions package offered by Core Air Conditioning Ireland. "We are very conscious of the need not just to solve clients' current needs but to future-proof their facilities in the context of technology changes and new innovations," says Dave Clarke. "The role of digitalisation across the HVAC sector is now coming to the fore so the product and system solutions we provide reflect this.

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- ✔ Fan Coil Units
- ✔ Fabric Ducting
- ✔ Acoustics

"It is now accepted that there is a direct correlation between digitalisation and energy efficiency/sustainability across the entire construction process. We aim to be at the vanguard of this development and to help our clients and trading partners embrace it by way of BIM in particular, and indeed all the other processes coming down the line in this context.

"Given the strategic development plan we've now put in place in marking our silver jubilee anniversary, our focus is not just on our own successful future but on that of our existing clients and trading partners, and all those we engage with going forward." ■

Left: The Baxi 800 boiler system.

Heating installers – no option but to fit a filter

Fitting a filter can improve the performance of a heating system, increase the lifespan of the boiler, reduce energy use and cut bills. This is more important than ever with so many people currently staying at home. Laurence Cox, Commercial Manager at Baxi Potterton Myson, details why it is so important that heating engineers explain to their customers the benefits of having a filter fitted.

Why fit a filter?

The combination of metals, water and oxygen can result in corrosion and build-up of debris, preventing hot water from flowing freely through the system. This in turn can prevent radiators from heating up properly so they take longer to warm the home, and cause damage which can lead to costly boiler breakdowns.

Filters are designed to clean the heating system using a magnet which collects any magnetite flowing through the pipework. The debris is collected in the sleeve of the filter while water is spun in a cyclone through it, helping any non-magnetic debris to be collected in a separate part of the unit.

While a filter plays an important role in maintaining a healthy heating system, it does not replace the need to flush the system, using an approved cleaner, and treating the water with an inhibitor.

Servicing a filter

Filters should be serviced every year, at the same time as the boiler is serviced. Show the homeowner how much debris has been collected to help them understand how it is improving the efficiency of the system. The ADEY filter won't reduce flow rate when full, but will stop collecting debris, so a service is essential to maintain performance.

Unscrew the bottom over a bowl, releasing any water in the filter. Next, use the filter spanner provided to remove the magnet, along with the debris, which can then be washed away. Finally, carry out an inspection of all the seals and rubber O rings to make sure they are clear of particles and undamaged or the filter could leak. Top tip: be sure to have a spare seal kit with you, just in case a replacement is needed.

In addition to reducing efficiency, one of the key issues with debris build-up is that it often isn't covered by insurance and can void existing boiler warranties. So, if the heat exchanger is blocked with debris, it could lead to expensive repairs.

Contact: Baxi Potterton Myson. Tel: 01 – 459 0870, or visit https://www.baxi.co.uk/our-boilers ■

The ADEY system filters out magnetic particles in the heating system.

Digital water sensors now creating smarter buildings

The world is becoming more and more urbanised. Our cities occupy just 3% of the earth's land but account for 60-80% of energy consumption. Yet the construction market is one of the least developed markets in terms of digitalisation, providing a huge improvement potential for optimising the water and energy management of buildings in all phases of the lifecycle.

The ecosystem, enabled by the Internet of Things, is changing what key assets in the water lifecycle can do across all phases of our buildings, from design, construction, operation and maintenance through to refurbishment.

Taking buildings to the next level

Developments in sensor technology, advances in machine learning and the prevalence of data exchange are unveiling new possibilities for efficiently managing water within buildings.

The Internet of Things, and the ever-growing connectivity of devices, offer new ways to optimise buildings' critical water systems and assets in the operation and maintenance stage. They can add real value by collecting digital data and using that data to inform decisions in real time, creating truly smart buildings.

Maintenance based on actual need

Traditionally, water systems have been maintained according to preventative regimes that mean most maintenance is performed prematurely. The smarter way involves insight from solutions that combine data and artificial intelligence (AI) to schedule maintenance based on the actual condition of assets, eliminating unplanned downtime and increasing availability.

Smart asset monitoring tools use electrical waveform analysis to provide insights into the performance of connected motors and pumps to detect upcoming failures. The software can reduce unplanned downtime by over 90% and reduce the costs of maintenance by almost a third. Beyond condition monitoring, this also gives insight on performance and energy consumption, adding value through data re-use for system optimisation.

Smarter metering options

Digital developments in water meters offer a wealth of options to access and analyse data, by combining smart water meters, advanced sensors and software analytics.

Automatic meter reading solutions collect water consumption, diagnostic and status data from devices, and then transfer that data to a central database for analysis. This enables facilities managers to actively monitor and dynamically optimise their water systems' functions within the building, from temperature to pressure.

Optimisation solutions for HVAC systems, for example connecting systems to smart platforms using existing BMS real time data and algorithms to operate HVAC systems as efficiently as possible, are also in development. These can cut electricity usage by 50% and save billions of litres of water.

Early warnings around the clock

New cloud-based device alarm software provides 24/7 online operational status and early warnings for connected devices, enabling smarter decision-making. Such service allows operators to remotely monitor assets from their smartphones, tablets or PCs. By connecting assets and harnessing their data, it allows for a timely and efficient service response. Planned inspections can be reduced and first-time fix rates increased, while the risk of downtime is minimised.

A vision for "digital water"

As a leading provider of innovative water solutions, Xylem continues to drive the development and implementation of essential digital water elements for smart buildings. Digital twin, Industry 4.0, AR, smart products and solutions connected to one integrated building information modelling methodology are no longer just a vision. It is now possible to solve water management across the entire lifecycle of buildings by interacting with the ecosystem of smart cities for the sustainable management of water and energy.

For more information on smart, digital solutions, visit: www.xylem.com/en-uk ■

Sodeca ventilation solutions from Lindab

Lindab Ireland is a wholly-owned subsidiary of the international Lindab Group that develops, manufactures, markets and distributes products and system solutions for simplified construction and improved indoor climate.

The products are characterised by their high quality, ease of assembly, energy efficiency, consideration towards the environment, and are delivered with high levels of service.

In particular, Lindab provides the ventilation industry with everything from individual components to complete indoor climate solutions. This has always been a prime industry consideration but, since the Covid pandemic and the emergence of wellbeing as a critical objective of building services design, it is now seen as an essential.

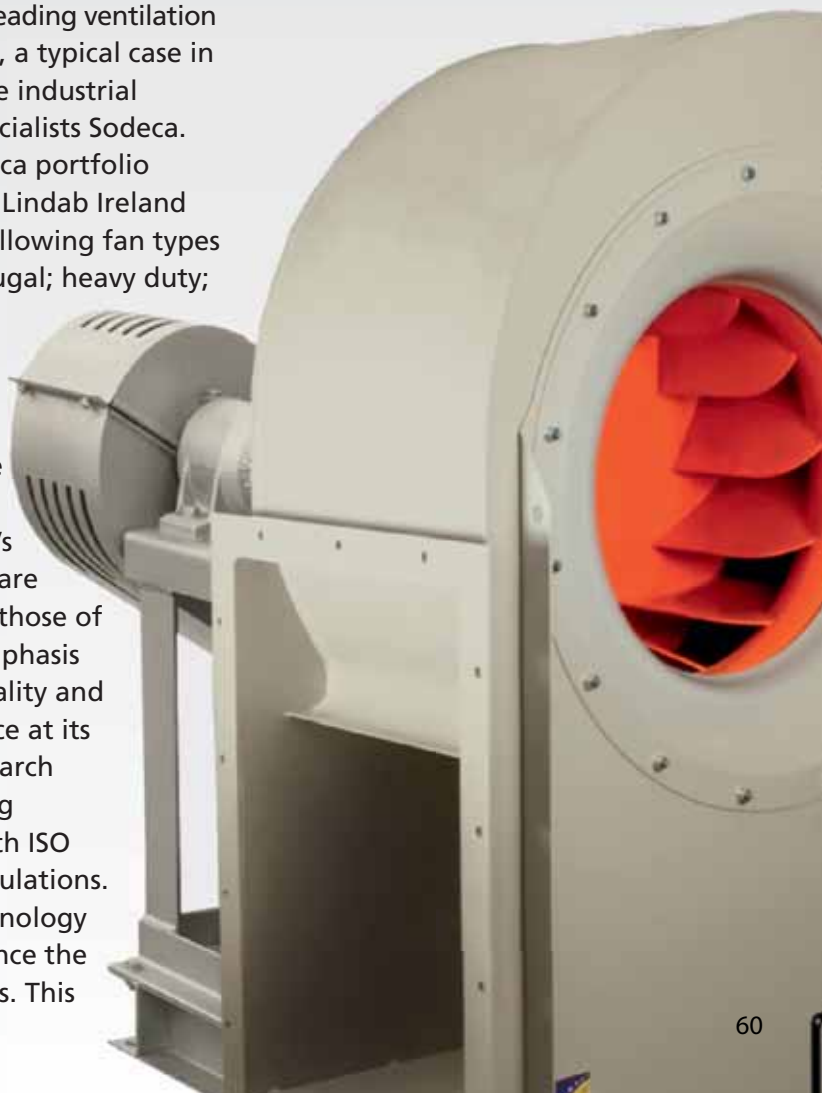
To this end Lindab's portfolio includes an unlimited range of functional, simple, economical and environmental ventilation solutions for both residential and commercial properties. The main product areas are circular duct systems and accessories, technical ventilation products and ventilation systems. In addition to this, it offers software for the design, calculation and planning of complete systems for ventilation and indoor climate.

This portfolio is made up of strategic partnerships with some of the world's leading ventilation market players, a typical case in point being the industrial ventilation specialists Sodeca.

The full Sodeca portfolio available from Lindab Ireland includes the following fan types – axial; centrifugal; heavy duty; pressurisation; ATEX certified; stainless steel roof; low pressure; smoke exhaust; and in-line. Sodeca's business goals are very similar to those of Lindab, the emphasis on product quality and customer service at its European Research Centre ensuring compliance with ISO and AMCA regulations. Advanced technology is used to balance the ventilation fans. This allows a high degree of manufacturing flexibility which in turn makes for customer-friendly service and an ability to support specific client needs.

Through the new PROJECTS Module for QUICKFAN and the CAD 3D or REVIT designs, clients can obtain full technical reports in a matter of minutes, thus saving time on design, massive data upload from Excel and facilitating the sending of projects to any other QUIICKFAN.

For details on the entire Sodeca range of ventilation solutions contact Lindab Ireland.
Tel Dublin: 01 – 456 8200;
Tel Cork: 021 – 432 0203;
Email: sales@lindab.ie;
www.lindab.ie ■



Andrew McEvitt joins Mitsubishi Electric

Mitsubishi Electric Ireland has appointed Andrew McEvitt to spearhead the promotion of its IT cooling and central plant. His role will be a dual one to serve both the Irish market and the wider EMEA IT Cooling sector. "Given Ireland's location in Europe as the European headquarters for many key players in the data centre sector, it makes perfect sense for me to be part of the Mitsubishi Electric team responsible for working with end-users, consultants, contractors and DX installers to deliver IT cooling solutions in the region.

"Irish engineering and contracting firms have consistently punched above their weight in the delivery of hyperscale data centre infrastructure throughout Europe and I'm here to offer Mitsubishi Electric's support to these clients as they work across borders and territories on challenging and critical projects".

McEvitt joins Mitsubishi Electric as it celebrates 40 years of business in Ireland. "It's a massive milestone for the company," he says, "and shows its long-term commitment to the Irish market. It also gives a great foundation as we seek to grow the IT cooling and central plant business in Ireland. Clients in these sectors can be assured that they will receive the renowned Mitsubishi Electric quality and service now, and long into the future."

> "The resources of Mitsubishi Electric are leveraged to deliver innovative and high-quality products.

Mitsubishi Electric worldwide is also celebrating its 100th anniversary, with the company's longevity based on a number of aspects. A strong commitment to quality, technology and the environment are particularly evident in the products and warranties that it offers. The standard 5-year warranty on the e-Series chiller range speaks to the quality and confidence that the customer can expect. Its class-leading efficiency (SEER of up to 5.52) and R32 low GWP refrigerant demonstrates that leading-edge technology and respect for the environment are key drivers.

The resources of Mitsubishi Electric are leveraged to deliver innovative and high-quality products. A key group within the company is Mitsubishi Electric Hydronics & IT Cooling Systems. Headquartered in Italy, it designs and builds equipment for the European market with over 50 years of experience in this critical sector.

"As an example, the s-Mext range of CRAC units brings together the 50 years of experience in the field of IT cooling with the renowned quality of Mr Slim outdoor units," says McEvitt. "Clients can now access lower GWP R32 equipment, long warranties, flexibility of installation and massive dealer support network for their DX requirements. Overall, the range stretches from 6kW CRAC units to large-scale free-cooling HFO chillers and many products between.

"It's a perfect example of using the best of Mitsubishi Electric to deliver class-leading products and solutions," concludes McEvitt.

Contact: Andrew McEvitt, Mitsubishi Electric IT Cooling & Central Plant.
T: 01 – 419 8800; M: 087 – 7037042;
E: andrew.mcevitt@meir.mee.com

Left: Andrew McEvitt, Mitsubishi Electric IT Cooling & Central Plant.

Vertiv™ Liebert® PDX with variable speed compressors

Liebert® PDX, equipped with variable speed compressors and Liebert® iCOM™ control, has been designed to be the most efficient, reliable, flexible and smart direct expansion cooling solution for data centers. It maximises part load efficiency, compared to most common direct expansion cooling systems, therefore significantly reducing running costs.

Liebert PDX ensures precise and constant control of airflow, temperature and humidity. Thanks to its innovative design and use of advanced technologies, it matches requirements for cooling continuity issued by the most trusted and adopted certification authorities for data center design and operation.

Liebert PDX enhances the inherent scalability of direct expansion systems, even those data centers where initial heat load is very low or subject to fluctuation.

Its wider operating range allows Liebert PDX to be a step ahead of the new challenges posed by data center requirements and climate change.

Liebert PDX smart control manages and optimises the overall system, is fully-programable via an advanced and user-friendly touch display, and can be linked with common BMS protocols, allowing remote supervision. Features include variable speed scroll compressors; fast start logic; virtual display; Eurovent certified performance; and equivalent piping length between unit and remote condenser up to 100m.

Liebert® PDX guarantees enhanced availability and redundancy features. It can automatically manage power failures and quickly restore quickly working conditions when power is back. Downtime is also minimised through the prevention of alarms and failures, along with real-time optimisation and adaptation of working parameters.

Thanks to variable speed drive compressors, Liebert® PDX, increases full and part-load efficiency, reduces starting current and improves power factor. As a result, power consumption and energy bills are considerably lowered. Power consumption is reduced further thanks to the new generation heat rejection condensers which are equipped with EC fans. They also reduce noise.

In addition, Liebert PDX cooling density has been maximised, allowing for reduced footprint and leaving more space for customers to install their IT equipment.

Variable speed scroll compressor technology is the best solution in terms of variable cooling capacity, with a minimum compressor speed down to 25% of maximum value. It improves annual efficiency even if requested cooling load is low, such as in the early stage of a data center life, or when the IT equipment usage is subject to big fluctuations. This reduces the cooling equipment's total cost of ownership and payback time.

Liebert® PDX remains the product with the widest range of air configurations available in the market and includes a full set of options and accessories to adapt to any type of data center design.

Liebert® iCOM™ control is the heart of the direct expansion cooling system, managing not only Liebert® PDX units but also outdoor heat rejection components (Liebert® MC or Liebert HCR condensers). Furthermore, it features a new 7" touch screen display for quicker and easier data readability.

Contact: Steve Wood, Sales Director, Core Air Conditioning Ireland.
Tel: 01 – 409 8912;
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email: steve@coreac.com

Main photo: The Stelrad Compact K3.

Above: Section showing the three panels and three fins.

Stelrad column vertical concept

Where radiators fit in the future

Heat pump technology has been embraced far more quickly across Ireland than has been the case in the UK. The development of lower temperature heating systems, utilising renewable heating appliances – such as ground source and air source heat pumps – has given the heating sector a challenge, but it's one it has risen to and is able to respond to effectively. But where do system components we have become familiar with over the years fit in to the future of heating?

On the radiator front, as well as developing aesthetically-pleasing radiators, Stelrad has developed models and series that meet specific requirements. These include a whole range of special application products that offer additional robustness in certain applications, additional rust resistance in areas of high humidity, or are "safe to touch" such as LSTs. The latter also improve safety for the elderly, young and vulnerable people.

But it's in the area of low temperature heating generated by environmentally friendly heating options like heat pumps that Stelrad has achieved most. It has developed and enlarged its series of K3 radiators – three panels and three fins on a radiator footprint that is scarcely larger than a traditional K2 design. Just recently three more of Stelrad's most popular designs were released in K3 format, and it has added larger radiators to most of its ranges so that radiators everyone is familiar with are relevant to lower temperature systems.

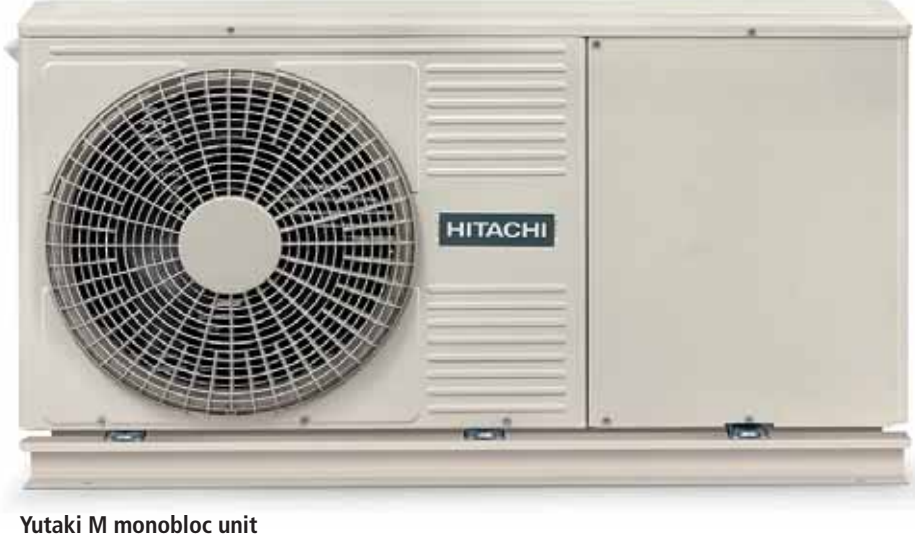
Stelrad has developed a wider range of vertical radiators too, adding a vast number of new designs and sizes to provide the larger radiators needed for renewable heating options. Nonetheless, they have a much-reduced horizontal footprint to slot into smaller wall areas in a room, while still providing the levels of heat required.

Great thought has gone into the latest radiator developments from Stelrad to ensure that all models are "fit for the future" and provide the levels of heat required in homes to keep everyone comfortable. That said, correct sizing is essential to ensure optimum performance. For installers, Stelrad continues to provide the leading heat loss calculator and radiator sizing tool free of charge via its website. It is simple to use and, after a couple of projects, becomes second nature to users.

See www.stelrad.com to learn more about the "fit for the future" campaign and prepare for the changes that are beginning to happen now. ■

Go green with Hitachi heat pumps

With its world-renowned reputation for quality, Hitachi's Yutaki air to water heat pumps deliver exceptional performance for heating and domestic hot water. Not only is it one of the widest ranges on the market with monobloc, splits and high-temperature models, but it also meets all European accredited standards.



Yutaki M monobloc unit

Speaking about the future, Gordon Sutton, JCI-Hitachi's Managing Director for UK and Ireland said: "Our Yutaki M and Yutaki S80 have been extremely popular where a mix of government initiatives and off-grid rural communities relying on oil or LPG for heating have seen renewable heat technology being installed in new builds and the retrofit boiler replacement market for some time.

"The heat pump system grants available through the SEAI as part of the Better Energy Homes Scheme means anyone with an eligible home and replacing an old boiler with an energy-efficient air source heat pump can claim €3,500, so there's a real incentive for Irish homeowners to embrace upgrading to renewable energy."

Hitachi's supplies its European customers are from its 40,000sq m manufacturing and training facility in Spain, delivering cutting-edge Japanese engineering technology with design and manufacturing processes to meet the needs of the European market. A new aircademy training suite in Maidenhead, England is opening this summer following the UK business' move to new premises earlier this year. Customers can book free product training, either virtual or at one of the purpose-built training centres, subject to availability and the latest Covid guidelines.

For more details about the Yutaki product range, or to make a training enquiry, visit www.hitachi-hvac.co.uk/ranges/heating ■

Rural case study

When the owner of a large rural property wanted to replace his inefficient, expensive-to-run oil boiler system he looked for an environmentally-friendly solution for his heating needs, including a swimming pool.

As the existing heating infrastructure of domestic radiators and a large pool heat exchanger were being retained, the customer needed a solution that would be compatible with his existing equipment. The Yutaki range of heat pumps are perfect for retrofit and renovation projects and

the Yutaki S80 high-temperature heat pump (above) was the ideal solution as flow temperatures up to 80°C can be maintained even down to extreme outside temperatures of -20°C.

Two S80 heat pumps were specified to meet the space heating needs of the house and the swimming pool. Hitachi S80 heat pumps can be installed in a cascade system where multiple heat pumps can be installed together to match high heating loads.

Following the install the customer has reported considerable running cost savings from his new Hitachi heat pumps.

Yutaki S	Yutaki SCombi	Yutaki S80	Yutaki M
Suited to new builds and wall-mounted boiler replacements	Integrated water tank makes it ideal for new-build and compact homes	Ideal for installations requiring high-temperature heating, such as oil boiler replacements	Compact monobloc outdoor unit, ideal for new-build and retrofit installations with limited indoor space

Electric boilers reinforce electrification of heating

With the EU, and indeed Ireland, not just embracing but actually championing the drive towards the electrification of heating, it is important to note that heat pumps are not the only answer, writes *Emmet Duffy, Managing Director of C&F Quadrant.*

Heat pumps are undoubtedly the most appropriate solution for many applications but not so for others, especially retrofit projects where the budget is not available to carry out the necessary "fabric-first" renovations essential when installing a heat pump. In situations such as this it is wise, and even desirable, to replace an ageing oil or gas boiler with a new, high-efficiency model rather than do nothing.

However, it is now also possible to go the electric route and install an electric boiler. For instance, ACV's E-Tech W wall-hung, sealed system electric boilers are available in a range of outputs from 15kW up to 36kW with options for single-phase and 3-phase electricity supplies. The units are all made up of a 10lt expansion tank, pressure gauge, safety valve, pump, low water pressure switch and automatic air vent. E-Tech W electric boilers are an ideal central heating solution and can also provide domestic hot water when installed alongside an ACV domestic hot water kit.

Another example from the range is the E-Tech S 240 Tri floor-standing electric combination boiler. Suitable for both domestic and commercial applications, it is an economical alternative to LPG and oil for off-grid locations. It provides both heating and hot water but can also be used as a stand-alone water heater. Quiet operation and no flue requirement mean it can be sited virtually anywhere, while the 25-year guarantee on the corrosion-resistant stainless steel cylinder ensures long life.

For electric to succeed it is vital that every watt of input results in useful hot water and heating. The new range of E-Tech S tank-in-tank thermal storage units is designed to do just that. Four conveniently-sized models are available and each benefits from the clever integration of ACV stainless steel tank-in-tank technology with an equally-advanced electric boiler control system.

The special design of the inner DHW tank not only helps ensure scale-free operation, but also avoids the sediment problems that plague conventional cylinders. To fully utilise generated energy, the tank-in-tank unit is wrapped in a generous 70mm of polyurethane insulation.

Benefits and features

- Quiet operation;
- No flue requirement;
- Reduced maintenance;
- Maximum reliability and longevity;
- Flexible installation options;
- Boiler body in steel;
- Small footprint;
- Integrated controls
- Simple to install and cost-effective;
- Suitable for off-grid location;
- An economical alternative to LPG or oil.

For more information on ACV electric boilers contact C&F Quadrant. T: 01 - 630 5757; E: sales@cfquadrant.ie ■

Examples from the ACV E-Tech range of electric boilers.

Trainer Keith Scully talks to *Building Services Engineering*

Grant eLearning Academy

Further to the launch of Grant's eLearning Academy, *Building Services Engineering* met Keith Scully, Technical Sales and eLearning Academy trainer, to find out more about this new online learning platform, and how the offering will benefit those working in the plumbing, heating, architectural and construction sectors in Ireland.

Q: Tell us about Grant's existing training facilities and what makes them stand out from others?

A: We have been welcoming those in the heating trade from across Ireland to our facility for many years to take part in product training courses and, at the beginning of 2020 officially opened our brand-new facilities at our HQ in Birr, Co Offaly. Representing a capital investment of €14 million, the facilities include a state-of-the-art R&D innovation centre, a customer services centre, and a dedicated training academy featuring an auditorium

Keith Scully, Grant Technical Sales and eLearning Academy trainer.

and training suite. The training suite and auditorium are fully equipped with the latest AV technologies to enhance the training experience.

These facilities are among the best in the industry and enable students to avail of quality presentations delivered by dedicated, knowledgeable trainers, while also having the opportunity to experience practical, hands-on elements and a tour of the factory.

We make it a priority to understand the people in our trade and deliver exactly what they want. This is another reason which led to the launch of the eLearning Academy which helped us ensure as many installers, plumbers, construction workers and architects could gain access to our high-quality training.

Q: How many people pass through the Grant training academy each year?

A: On average, we see around 800 to 900 people pass through our onsite training facilities each year. They represent a diverse range of trades including installers, plumbers, engineers, architects, BER assessors, specifiers, builders, electricians and more.

Generally, we are commended on our great facilities and our easy-to-understand course content and we do tend to see the same faces return year on year to complete new training courses.

Once it is safe to open our doors again, and with the addition of the eLearning Academy, we expect to have the ability to offer training to thousands of tradespeople from Ireland and the UK.

Q: How do the Grant training courses address changes in the industry?

A: As the heating industry develops, it's very important that those in the trade continue to upskill to keep up to date with new advancements in technologies and installation processes.

Our training is carefully planned and designed to reflect industry developments, with each course devised to ensure participants can achieve the learning objectives set. We understand that everybody learns in a different way and we make sure that all levels and abilities are catered for.

To ensure our courses stay relevant in terms of industry developments, we constantly update our training material in line with industry legalisation and best practice. In addition, our dedicated trainers make it their business to keep up to date with any industry changes and act as a knowledge hub to keep our trade network on the right track.

> To ensure our online training is as interactive and user-friendly as possible, several of the courses are instructor-led and all others are on-demand. This allows participants to complete the courses at their own speed, in their own time.

On completion of all of our onsite and online courses we want every trainee to feel they are better equipped to install, understand and be satisfied that their work involving a Grant product is to the highest required level. This will firstly help to grow their business and reputation and secondly, will ensure the homeowner is reassured of a quality product fitted by a competent tradesperson.

Q: What is the most popular course and why do you think this is?

A: The oil boiler product training has been completed by over 4,000 attendees, due to the popularity of the Grant Vortex boiler range. This is closely followed by the Aerona^3 R32 heat pump training course, which has become extremely popular over the last couple of years due to the demand for renewables and the new Building Regulations' requirements.

Q: Is online product training just as effective as onsite product training?

A: Although our onsite product training allows for more face-to-face interaction and development of questions, there are no differences between the courses on offer.

Both our onsite and online training presentations are the same, meaning participants are provided with the same teachings and information, whether they are online or onsite. To ensure our online training is as interactive and user-friendly as possible, several of the courses are instructor led and all others are on-demand – allowing participants to complete the courses at their own speed, in their own time.

Q: Why should all installers, plumbers and merchants enrol in the eLearning Academy?

A: As the heating industry moves forward, those who trade within the industry must keep up to date with current and future technologies … where better to do so than where they have been trained for the last 10 to 15 years.

Grant now sees three generations of installers, plumbers and merchants – the first who began in the 1970s fitting the Grant back boiler; the following generation installing the Grant Vortex oil boilers; and the current generation moving towards renewables and trusting in the Grant Aerona^3 heat pump range.

We have many attendees who, over the years, attended our Sahara Solar Thermal course, then the Vortex Oil product course, next the Spira wood pellet course, maybe the Vortex Combi course, and of late the Aerona^3 course. All because they trust the Grant name and are assured that both our onsite and online training is to the same high standard as the products that bear the Grant name.

By registering with Grant's eLearning Academy, those in the heating trade will have access to both beginner and advanced Aerona^3 training, as well as all other Grant training courses and resources.

Visit www.grant.eu for more information on Grant's eLearning Academy. Follow Grant on Facebook and Twitter @GrantIRL or Instagram @Grant_IRL. ■

COMMERCIAL HEAT PUMPS ...

Talk to an expert!

Nick Eldridge, Technical Sales Engineer, Euro Gas.

"Can you give me the cost of a 100kW heat pump?"

"Absolutely, what flow temperature do you want it to operate at? What ambient air temperature do you want it to achieve … 100kW? Do you want to include the defrost energy or not?"

A conversation that starts like this is one you could well expect to hear when ordering a meal at Burger King, not one when you're looking to simply get a price on a product. However, making sure that you're evaluating and selecting the right product could be the difference between being nicely full, or being left with hunger pangs! So says *Nick Eldridge, Technical Sales Engineer, Euro Gas.*

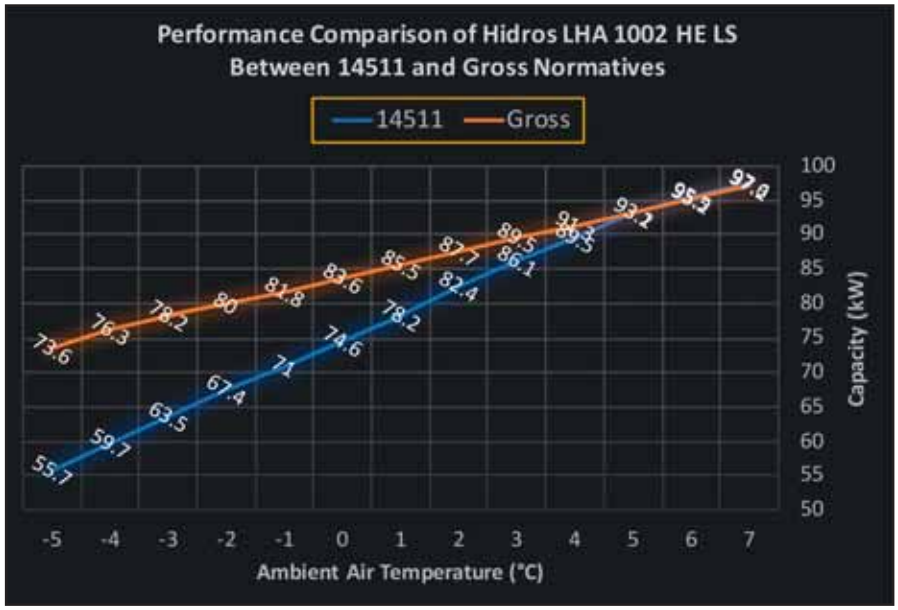
The same applies to heat pumps. A heat pump is not a boiler. A boiler doesn't care what temperature it is outside, it just happily chuggs away operating at its set point. If you pay for 100kW, you know you're getting 100kW.

A heat pump is a little different. It uses energy absorbed from the air to boil liquid refrigerant and turn it into vapour. This change of state can occur even at -10/-15°C because the boiling point of the refrigerant is so low. At these conditions the energy available in the air to boil the refrigerant is obviously less, so the heat pump capacity decreases.

Gross v. EN14511

That is not the whole story though. As the energy available in the cold air becomes less, a greater volume of air is required to pass across the evaporator coil in order to boil the refrigerant. The heat pump fans have to spin faster to achieve this. The air temperature off the coil is approximately 3K less than the ambient air temperature. Thus, as ambient temperature reaches 3°C, ice starts to build up on the coil. If this ice is not cleared, the evaporator will not be able to boil the refrigerant and liquid will enter the compressor. Liquid is not easily compressed and will damage the compressor.

There are a couple of ways to model heat pump performance and,



> Selecting a heating system that uses lower flow temperatures is therefore key in maximising heat pump efficiency and meeting Part L

if you look at any manufacturer's brochure, you will see they refer to the EN14511 normative. Air is nearly always 7°C and the flow temperature is typically 35°C or 45°C. EN14511 takes into account the energy required to operate the user circuit pump and, most importantly, accounts for the energy required to defrost the heat pump. At 7°C this isn't a huge factor but, depending on your design condition, this can typically be between 15-25% reduction from the gross capacity of the unit.

Sizing on gross can give some spectacular capacity and COP figures and can lead to a much smaller and cheaper heat pump selection. However, defrost is a fact of life that needs careful consideration when choosing heat pumps and the energy required for it has to come from somewhere.

COP/SCOP

Coefficient of performance (COP) and seasonal coefficient of performance (SCOP) is a quotient representing efficiency:

$$COP = \frac{(\text{Power Out Thermal})}{(\text{Power In Electric})}$$

As the flow temperature increases, fans have to spin faster to move more air across the evaporator, and the compressors have to work harder. This raises the electrical input required and even though the capacity of the heat pump may increase, the COP quotient drops.

A higher flow temperature requires more air, therefore the defrost frequency increases as the flow temperature rises. Lower efficiency spread across the season results in a lower SCOP.

Selecting a heating system that uses lower flow temperatures is therefore key in maximising heat pump efficiency and meeting Part L.

So, when it comes to heat pump sizing and selection, talk to an expert.

Contact: Nick Eldridge, Technical Sales Engineer, Euro Gas.
T: 01 – 286 8244;
M: 085 – 272 0430;
E: nick.eldridge@eurogas.ie

SEAI Energy Awards 2021 open for entries

The Sustainable Energy Authority of Ireland (SEAI) is calling on communities, businesses, organisations and individuals that are championing sustainable energy to enter the SEAI Energy Awards 2021. Now in the18th year, the SEAI Energy Awards reward those individuals and organisations who really push the boundaries in energy efficiency best practice, innovative renewables, awareness raising and inspiring others.

The SEAI announced the Awards at the SEAI virtual Energy Show. Speaking at the launch, Fergus Sharkey, Head of Business and Public Sector with the SEAI said: "More than ever, it is imperative that Ireland uses less energy, moves away from fossil fuels and takes advantage of innovative energy solutions to address the climate crisis. The good news is there are already communities, businesses, individuals and organisations blazing a trail for the rest of us to follow.

"The SEAI Energy Awards celebrate these champions and leaders. We showcase their achievements, hopefully inspiring others to act. If you believe that you, your community or your organisation is among these leaders, I strongly encourage you to enter the SEAI Energy Awards 2021 so we can celebrate your achievements."

Entries can include any combination of electricity, heat or transport energy use. There are nine categories to choose from including Large Business; Small and Medium Business; Public Sector; Energy Community; Buildings; Renewable Energy; and Energy Manager or Team. The winner of the Research and Innovation category will receive a bursary of up to €10,000.

The SEAI is also seeking entries to the Emerging Sustainable Energy Champion category. This category recognises the extraordinary work of young people around Ireland to promote sustainable energy, a key pillar of climate action.

The closing date for entries is Friday, 18 June 2021. The winners will be announced in October. For further information and details on how to enter the 2021 SEAI Energy Awards visit www.seai.ie/energyawards

Right: Michael Curran, NUIG with the trophy for the Excellence in Energy Research and Innovation Award 2020.

LIGHTING

Lighting for health and productivity

In this detailed and analytical article *Ruth Kelly Waskett, Associate, Hoare Lea and President, Society of Light & Lighting,* explains why light is so important for health and wellbeing, and suggests that providing solutions is a lot more complex than just installing lighting that changes colour temperature.

At the turn of this century, scientists discovered that in addition to the rod and cone photoreceptors in our retinas that enable us to see, there is a third type of photoreceptor whose function is completely different. Commonly referred to as non-visual photoreceptors, they are essential for keeping our bodies in harmony with the 24-hour light-dark cycle of the earth. They regulate the production of key hormones such as melatonin and cortisol, which in turn determines when we feel alert, sleepy or hungry. The cycles of these hormones are often referred to as the body clock, or circadian rhythm.

Ruth Kelly Waskett, Associate, Hoare Lea and President, Society of Light & Lighting

20 Old Bailey, London – Lighting design intent was based on providing light volume to make spaces feel light and airy, paying close attention to key art pieces and providing visual cohesion on both floors. © Hufton+Crow

Since their discovery, further studies have found that the non-visual photoreceptors are most sensitive to light in the blue part of the visible light spectrum. Unsurprisingly, daylight has all the qualities that make it the perfect light source to synchronise our body clocks, with a high amount of energy in the blue part of the spectrum earlier in the day, and less blue energy towards the evening.

Lighting solutions

The discovery of non-visual photoreceptors, combined with the advent of LED lighting, has given rise to a number of innovations in lighting. These are primarily concerned with providing artificial light that can support our health, in a world where we spend most of our time inside buildings. It started with Human Centric Lighting, a term that soon fell out of favour as many objected to it on the grounds that all building lighting is designed for humans. More recently, the term Circadian Lighting has been used to describe a lighting system that is designed to support the health of occupants. At the same time, the popularity of Tuneable White lighting has increased as people recognise the potential benefits of light sources than can change colour appearance throughout the day. So, what's the difference between Circadian Lighting and Tuneable White?

Spectrum and colour temperature

To understand the difference between the two approaches, it's important to understand the key principles of light spectrum and light colour. Light colour is defined in terms of its correlated colour temperature (CCT) in degrees Kelvin (K), the equivalent temperature of a black body radiator. A low CCT, for example 2000K, will produce a "warm" white light with a yellow appearance, while a higher CCT, such as 6000K, is a "cool" white light with a blue-white appearance.

All light sources have a spectral power distribution or SPD. This is the amount of energy that is contained within each of the wavelengths of visible light.

Two light sources can have the same or similar CCT but very different SPDs. If the purpose of a lighting system is to elicit a circadian effect, it isn't the CCT that matters, it's the SPD content.

Circadian Lighting and Tuneable White

Put simply, Circadian Lighting is lighting that is designed to deliver appropriate light at the eye throughout the day in order to support the human circadian system. This is achieved by using light sources that can produce a range of spectral compositions and resulting CCTs. These are combined with a dynamic control programme that delivers a sequence of light quantity and spectrum designed to mimic the natural light cycle. A typical sequence would involve delivering a high illuminance with a high blue-spectrum content in the morning, and a lower illuminance with a low blue-spectrum content in the afternoon.

Tuneable White lighting allows the user to select any correlated colour temperature (CCT) within a pre-defined range. In contrast to Circadian Lighting, Tuneable White doesn't promise any circadian benefits *per se*, because it is primarily concerned with the outward appearance of the lighting, not the spectral content. Tuneable White can be used for a specific purpose, such as to have dim-to-warm sources, or to have a range of settings that give different CCTs. Users can, in theory, have any control sequence to suit their preference.

The technology used to deliver the two different types of lighting can be the same: clusters of white LED chips of different CCTs. What's different is how that technology is employed, and ultimately what the objectives of the system are.

Beecroft Building, University of Oxford — Flooded with natural light, the building takes advantage of the unusually generous ceiling height and uses a minimum of general lighting. © Jack Hobhouse

Is it worth it?

So, the real question is … is it worth it? The answer, of course, is it depends. It depends on what you want to achieve with the system, and what your expectations are. The circadian benefits of these kinds of lighting systems are very difficult to measure directly in the field, so research evidence is thin on the ground. However, there are several studies indicating that people prefer dynamic lighting over static lighting, whether it is changing the amount or the colour of the light. On that basis, it can be said that any well-designed dynamic lighting is almost certainly better for occupants' wellbeing.

A final point to consider is daylight. If occupants have been exposed to daylight during their journey to the building, and/or if they have good access to daylight during the day, the benefits of this daylight exposure will dwarf the effect of circadian lighting interventions. If a space is already well daylit, then the value of introducing Tuneable White or Circadian Lighting is questionable.

Conclusion

Let's take a step back and remind ourselves what we're trying to achieve with these kinds of lighting systems. We want to create buildings that support the health and wellbeing of people, and the solution to that is a lot broader than just installing lighting that changes colour temperature. Designing for daylight first, lighting the vertical surfaces, thinking about the needs of the occupants and having a lighting control system that is accessible for the users are all arguably more important. ■

Lighting in some of the meeting rooms at Investec, 55 Gresham Street, London. © Hufton+Crow

Change must embrace diversity and be inclusive

The recent election of Kevin Kelly as President of the Chartered institution of Building Services Engineers is a timely and well-deserved accolade. It recognises decades of unstinting service not just to the Institution, but across the entire spectrum of building services engineering. Apart from high-profile roles as CIBSE Ireland Chairman, SLL President and various CIBSE Committee appointments, he was instrumental in shaping the evolution of engineering education during his many years with DIT (now TU Dublin). He took up the position of CIBSE President in the first week in May and here we reproduce extracts from his Presidential address.

It is a great honour to be the second Irish CIBSE President. Eoin Kenny was the first in 1986. I believe my presidency has come about in recognition of the great work of CIBSE Ireland over many years.

What is clear in this era, and going forward, is that the only constant in our lives will be change. The last 15 months have seen quite profound change and many new challenges for the world. The Covid-19 pandemic hit everyone like a hammer-blow but our industry responded extremely well and served at the forefront in delivering helpful solutions.

While many people have tragically lost their lives, everyone has been affected. This is what our future may look like with a continually changing health environment and challenges we have not faced before. The effect on the economy is also very significant.

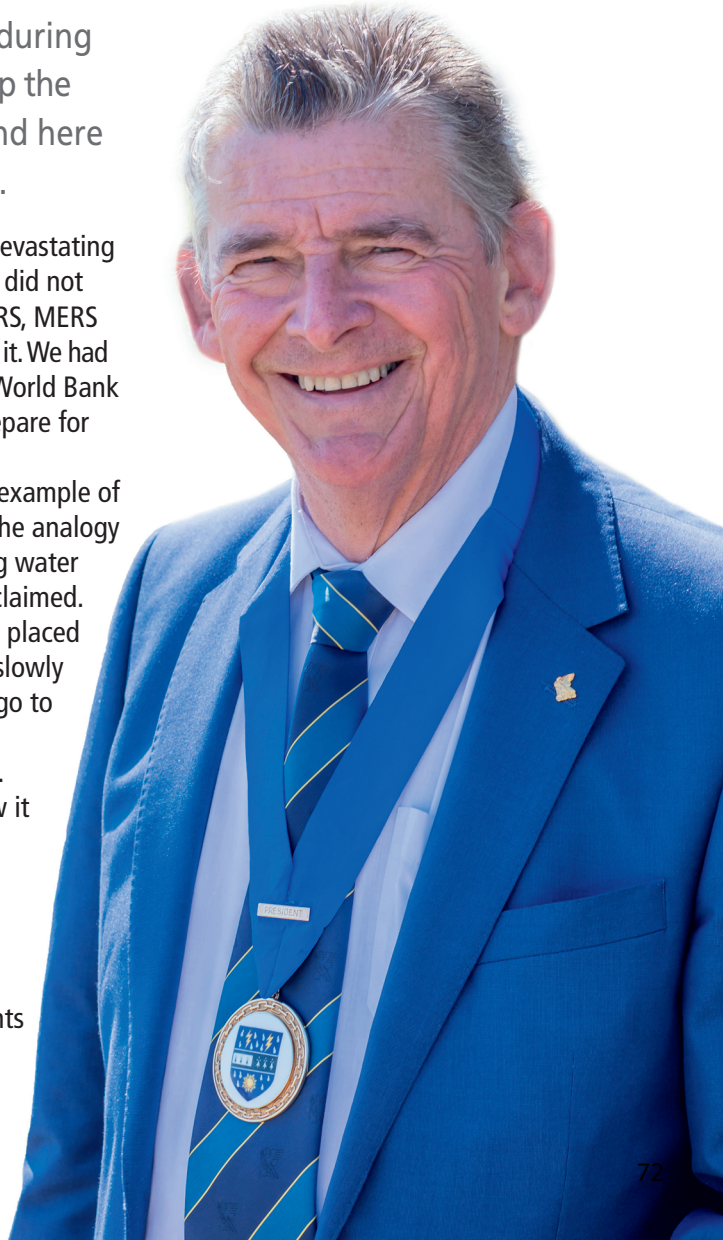
The development of the vaccine is both an interesting and inspirational example of what educated, talented researchers can achieve when faced with such a sudden and devastating event. However, Covid-19 did not come out of nowhere. SARS, MERS and Ebola all came before it. We had earlier warnings from the World Bank and even Bill Gates to prepare for a pandemic.

This reminds me of the example of reactions to change and the analogy of placing a frog in boiling water – it jumps out, or so it is claimed. Alternatively, if the frog is placed in a pot and the water is slowly boiled, then the frog will go to sleep and not respond adequately to save its life. This clearly illustrates how it is often more difficult to respond to a slower-changing environment than a fast-changing one. Covid-19 required such a response from governments who took urgent action, while everyone promptly changed their behaviour.

Our industry was not found wanting and made an outstanding response to this challenge. Examples include the CIBSE experts who contributed to the building of various field hospitals throughout the country; those who developed CIBSE's guidance for ventilation and the reopening of buildings; and others who contributed to the work of various industry representative bodies to help address the new challenges that Covid-19 presented.

Climate change

Global warming may also be a "sleeping frog" issue. We are facing enormous challenges to reduce our carbon emissions. I am not convinced that everybody in our industry fully appreciates the extent of the challenges climate change poses, or the urgent



need to take action across the built environment. Are we like sleeping frogs on this? We must take action now in how we educate undergraduates in the built environment professions, in our own training and in the CPD programmes we undertake. The CIBSE Climate Action Plan is an excellent starting point.

To respond adequately to slow-moving change, organisations need to be more agile than most are at present. We can achieve agility by being inclusive, increasing diversity and promoting equality in our organisations; by giving life to a wider voice representing the wider community; and by ensuring we have a greater awareness of changes in our environment. An inclusive organisation seeks to represent the society it is set in.

There are often challenges and difficulties for people of minority groups entering, and fully engaging in, these organisations. Male-dominant cultures don't just miss a trick, they miss a lot of what is going on. Being inclusive is not an act of generosity, it is essential for organisations to survive in this changing world. Inclusivity is the way we can stay connected and alert to the external environment, particularly when change is happening slowly … this is when frogs fall asleep!

Addressing deficiencies with respect to inclusion is not a comfortable discussion to have and I certainly claim no expertise in this matter. However, those presently under-represented need allies in senior positions to support them, and even act as mentors or sponsors. Senior people need to give face time, listen to issues raised and even risk saying the wrong thing occasionally. We need to lean into the discomfort in order to facilitate change, accept criticism when it comes our way, reflect on it and empower minority ethnic and other groups.

Unconscious bias

In her book *Invisible Women* Caroline Criado Perez highlights a modern first-world for women where instruments are too big, cars are less safe and drugs are incorrectly prescribed. This is because research studies are male-dominated with subjects. Perez cites the example of the NY Philharmonic Orchestra which had almost no women for many years. The women just weren't as good as the men *until* the 1970s when the number of women recruited reached about 50% of the total. So, what happened? Did the women get better? No. Blind auditions happened and with it the elimination of unconscious bias.

We are all on a journey together, learning as we go, improving our organisations and creating an atmosphere of trust and support. We must identify bias in order to address it. As professional engineers, blatant discrimination or bullying in your presence must be called out at the time for what it is. This is part of behaving ethically in a modern society.

Point 11 of the CIBSE Code of Professional conduct states that we must "treat all persons fairly and with respect, and embrace equality of opportunity, diversity and the elimination of discrimination." We should consider the role of positive discrimination where appropriate to achieve a better balance of opportunities.

Flexible routes for progression

Opportunities for progression in our industry are vital at every stage. Ladders of opportunity are something we must always be conscious of creating. Historically, poor management looked at what a person couldn't do and identified barriers to their progression. Modern successful managers look at what a person can do and give people a chance by way of a clear pathway forward and mentoring.

CIBSE has established non-standard routes to CEng and IEng for those with sufficient industrial experience but without the accredited qualifications. We ask applicants to demonstrate competence and to offer robust evidence in this regard. This is enlightened in my view and allows us to encourage applicants from a diversity of backgrounds to take advantage of our non-standard routes to membership.

Succession planning

CIBSE has taken an active position in succession planning. We actively encourage our Regions, Groups and the CIBSE Divisions to seek wider participation in their committees. We want to develop a steady and more diverse flow of volunteers to these roles. We are also very grateful to those who have served loyally in these positions for many years and for their dedication to CIBSE.

Going forward we will develop our website to better advertise panel and committee vacancies, including person specs and time commitments, and ensure that we are inclusive and transparent in all opportunities. This is part of our determination to maintain a fresh flow of talent into leadership positions, increase our bandwidth, and provide wider representation of the industry, the people and the society we serve. I would ask senior people and companies to encourage and facilitate all their employees to participate in these opportunities. They allow for personal and professional development, provide networking opportunities and ultimately a better-functioning professional community.

We have a long and tricky road ahead, but we have a talented team of volunteers in CIBSE, including CIBSE Ireland, to help address the challenges we face. Our volunteers exemplify CIBSE values, while CIBSE empowers others with knowledge; champions talented people; inspires others to join and contribute; and provides leadership across the CIBSE community. In order to maintain a full bandwidth and understand the whole story, we must embrace the awkward and difficult conversations ahead, and lean into them in order to change our industry for the better.

We'll realise this objective by making CIBSE more inclusive and welcoming to all." ■

THE OBTUSE ANGLE

PAT LEHANE

Sustainability hypocrisy!

When are we going to inject some honesty into the sustainability debate? For electric cars read batteries that require vast quantities of nickel, cobalt and other metals. That demand will multiply exponentially as the demand for energy storage systems does.

Meanwhile, the world is still turning a blind eye to the rainforest destruction caused by nickel mining in Indonesia, not to mention ignoring the use of child labour to mine cobalt in the Democratic Republic of Congo.

Now we have yet another "green" initiative … mining these precious metals from the sea bed. The WWF, some scientists and various green activists – including Sir Richard Attenborough – say this has the potential to be devastating to marine life.

However, the ironically-named DeepGreen company plans to commence deep-sea mining for nickel, cobalt, etc in 2024 … and all so we can "save the planet" by driving electric cars.

Behold! … the age of the MSI has arrived

With digitalisation, lean construction and innovative building engineering products/systems/software now becoming the norm, the management of construction projects has become far more sophisticated and challenging.

Hence the emergence of the Master System Integrator (MSI) role, one that is commonplace in the US but is now being sought on projects here in Ireland, especially by the global tech giants.

Simplistically, MSI represents a paradigm shift in the role of traditional project management … one that is incredibly more complex and demanding. However, it is a role that ambitious building services engineers would do well to embrace for an exciting and fulfilling future.

Congratulations Mr President

Having worked closely with Kevin Kelly on various projects over the years, his recent election as CIBSE President all but went over my head. You see, I would have expected nothing less.

His contribution to CIBSE Ireland, CIBSE Inc and the broader building services engineering sector has been phenomenal.

On reflection, I realised that to be elected worldwide CIBSE President is also a phenomenal achievement but, in Kevin Kelly's case, a totally deserved accolade. So, congratulations Kevin.

Why not simply KISS?

We're all familiar with KISS – keep it simple, stupid – yet it hardly comes into the reckoning in the green debate. Here we are spending vast sums on new technologies while, to a great extent, ignoring the low-hanging fruit staring us in the face.

With so much EU grant money being (rightly) thrown at innovative initiatives, perhaps it is also time to consider support for simple, common sense – but evidence-based – approaches.

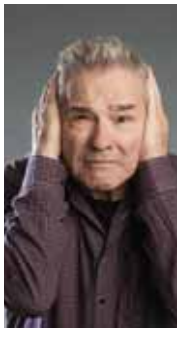
For instance, research in the US has shown that cows emit 82% less methane when small amounts of seaweed are put in their feed.

Unilateral banning of fuel sources and appliance types is great for the populist soundbite but it is lazy and lacks imagination.

None so deaf as …

Even before the UK's Green Homes Grant scheme began, the National Federation of Builders (NFB) repeatedly warned UK civil servants about issues that would plague successful implementation. They were ignored and, not surprisingly, the scheme failed and closed on 31 March 2021.

A huge flaw of the scheme was that too few companies were accredited to do the insulation and air tightness works. The NFB had flagged this but legislators/civil servants did not listen. Ring any bells closer to home?



If the environmental policy makers want to truly address the dual challenges of energy saving and carbon reduction, it's time to stop paying lip-service to "industry consultation" and honestly engage with, listen to and learn from those who know the situation better.

Safe driving Joe

Joe Grogan of J & J Grogan Construction pictured with Jimmy Feery, Branch Manager, Chadwicks Tullamore and the Toyota 211 Proace City van Joe won in Chadwicks' recent store promotion.

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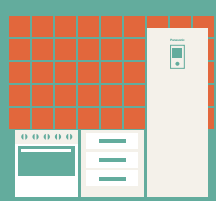

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